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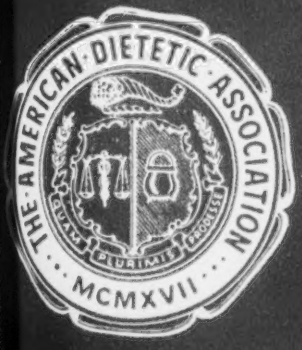

38th A.D.A.
Annual Meeting
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October 18-21, 1955

Metabolism—Evolution of the Concept — *George Rosen*

Satiety Value of Diets for Reducing — *Jeffrey H. Freyer et al.*

Blood Changes after Different Breakfasts — *Mary M. Clayton and Shirley Wing Randall*

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Metabolism: The Evolution of a Concept[1]

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METABOLISM is today a fundamental concept of biology and medicine. The underlying idea, that nutritional material taken into the body is chemically transformed in it and used to build up the body, to replace worn out tissues, and to provide energy for the processes of movement and thought, is familiar even to the layman. The concept is apparently so obvious and so much a matter of common sense that one tends to forget that it is actually of rather recent origin. But while the concept of metabolism in its present form is only about a hundred years old, it actually came into being as the product of a much longer evolutionary process.

Medicine as we know it is relatively young, but its roots go back to the very beginnings of mankind. It developed in response to an elemental human need and is a part of man's continuing effort to acquire mastery of his environment. Medicine is a field where theory and practice meet because of the urgent need for some way of dealing with problems of health. Throughout history, men have accumulated knowledge about health and disease and have endeavored to systematize and conceptualize this information. To act effectively, the physician must have a body of knowledge and an accepted frame of reference, that is, some concept of the nature of the normal structure and function of the body and some idea of the reasons for disease, so that he can define and deal rationally with the concrete situations he faces.

HOW CONCEPTS ARE FORMED

Very early in history efforts were made to develop such formulations, and in the civilization of ancient Egypt we find the first step toward a medical science, an endeavor to explain health and disease rationally. The oldest medical literature of Egypt offers a theory of physiology and pathology based on the alleged existence in the human body of a system of vessels stemming from the heart and connecting it with other parts of the body. These vessels were believed to be channels for the transportation of various body products, such as blood, urine, and others. Disease resulted when these vessels did not function properly (1). It seems plausible to suggest that this idea was derived from Egyptian experience with the irrigation and drainage canals that covered their land and the conditions that resulted when these were out of order.

Another early example of this type occurs in *Regimen* I, a treatise of the Hippocratic Corpus (2 [pp. 248–263]). In this instance, ideas derived from the techniques of various craftsmen, such as the smith, the potter, the cobbler, the carpenter, are used as clues to an understanding of human physiology. The writer of this work wished to act on the body in such a way that the individual's health would be preserved and promoted. He prescribed exercises, massage, diet, and bathing and tried to get a clearer understanding of what he was doing by drawing analogies between physiologic processes and industrial operations. The analogies are quite fantastic, but the significant point is the approach and the method employed, not the result.

Alexandrian medicine carried this approach one step further by undertaking to explain biologic phenomena in terms of a clearly defined physical theory. Strato of Lampsacus, who headed the Lyceum at Athens from 287 to 269 B.C., developed a theory of the nature of a vacuum based on experimentation (3, 4).

Among his followers was the Alexandrian physician, Erasistratus, whose name has come down to us in connection with his work in physiology. Erasistratus accepted the views of Strato on the vacuum, and they provided the basis for his theory of the vascular system (4). Certain facts were known to him. He knew that when an artery in a living animal is cut, blood spurts from it. He also knew that in a dead animal, the arteries contained air, not blood.

[1] Presented at the 37th Annual Meeting of The American Dietetic Association in Philadelphia, on October 28, 1954.

In addition, Erasistratus was convinced that the division of veins and arteries in the body which could be seen also continued beyond the limits of vision, and that the tissues were made up of these minute subdivisions linked together. But how were these facts related? Erasistratus believed that Strato's vacuum made an answer possible. He concluded that the blood is normally carried by the veins, while the arteries carry air received from the heart. When an artery is cut, the air escapes, creating a vacuum. Through the pull of this vacuum, the blood is carried from the veins into the arteries whence it spurts forth. This ingenious explanation was fatally inaccurate, but this does not alter its importance for our theme. Indeed, together with the other instances previously cited, it leads us to the very heart of the matter.

The function of a theoretical formulation, such as a concept, is to subsume a body of knowledge under a general idea and thereby to give meaning to its existence. At one period or another, therefore, a concept corresponds to certain levels of knowledge that have been achieved. However, concept formation is determined not only by scientific and technical knowledge, but also by intellectual milieu and social environment (5). This implies that a concept of metabolism could be expected to evolve only in a society where certain favoring conditions were present.

For example, the development of a secular, calculatory approach to medical and biologic problems clearly owes much to an intellectual climate derived from machine technology and rational business calculations. Descartes identified the living body with a machine, and this metaphor is more than likely due to the fact that he was an engineer. Indeed, his textbook of physiology is an engineer's view of how the living body works. Thus, to him, the pump, valves, and forces of the circulatory system were directly comparable with the operation of machines.

As an assumption in dealing with the experimental problems of medicine, the concept of mechanism proved increasingly successful. Even though this theory might be inadequate as a complete interpretation of biologic phenomena, it did make it possible to go a long way toward an understanding of the problems of health and disease. Indeed, mechanical materialism implicitly still underlies a great deal of medical research, and recently in the form of cybernetics has enjoyed a rebirth of popular attention. With the concept of the machine is linked the idea of rational accounting as the norm for large industrial undertakings. This approach has likewise colored our thinking in many ways. Only in a society where such concepts prevailed could the idea of metabolism as an exchange of material and energy evolve and be successfully pursued. It is indeed no accident that some of the great discoveries that laid the basis for our notion of metabolism followed a period during the seventeenth and eighteenth centuries which had speculated on the "machine" character of the biologic organism (6).

VESALIUS, HARVEY, AND PARACELSUS

At the same time, certain scientific conditions and stimuli were required for the development of a concept of metabolism. Involved in this notion is a view of the body as a closed system within which energy input and outgo can be investigated and measured. Not until the sixteenth and seventeenth centuries, however, did this become possible. The foundations for an accurate knowledge of the structure of the human body were created by Andreas Vesalius, his contemporaries and his successors. Thenceforth, medical men were able to operate with a comprehensible view of the body as a structural unit. Equally basic is William Harvey's discovery of the circulation of the blood. Harvey linked anatomy with dynamics, thus providing a firm basis for consideration of the body as a functional system.

Today, when the application of chemistry to biology and medicine is practically taken for granted, it may be difficult fully to appreciate the originality of mind required for such a step in the sixteenth century. Yet this is the achievement of Theophrastus von Hohenheim, better known as Paracelsus. Like Vesalius and Harvey, Paracelsus also undertook a daring foray into the future. Nevertheless, in terms of concrete achievement, the legacy of Paracelsus was far smaller than that of either Vesalius or Harvey. The reason for this is not far to seek.

While Paracelsus did indeed force medicine to take note of chemistry, he dreamed of something for which the time had not yet come. For the problems of health and disease, there was as yet little or no chemistry with which to tackle them. Indeed, the very fundamentals of chemistry in general had not yet been laid down, and before this was done it was of small avail to try to deal chemically with complex biologic phenomena. Not until chemistry was revolutionized at the end of the eighteenth century did it assume more significance for medicine. Nevertheless, the fundamental view that vital processes were to be comprehended chemically opened the way for a future concept of metabolism.

THE EARLY GREEK SCIENTISTS

Clearly, investigation and understanding of metabolic activity required a knowledge of the fundamental physical and chemical laws to which biologic organisms are subject, as well as effective methods of observation and experimentation so as to determine the nature of air and of the nutritive materials that enter the body, and to establish their fate within it. In the light of these requirements, it is small wonder that the physicians and scientists of antiquity had no concept of metabolism. Much might be said about the range and brilliance of scientific achievement in

classical antiquity. At Athens and Alexandria, the organization and prosecution of scientific investigation reached a high state of development. Solid contributions were made to astronomy, geography, biology, and medicine, and the theory of an experimental methodology was outlined.

Erasistratus, for example, pointed out (7) that one accustomed to investigation undertakes the study of a problem by "worming his way through and turning in all directions," thus directing "his attention to one thing after another which he considers relevant to the subject under investigation until he arrives at the solution of his problem." Furthermore, this theory was actually applied, as in an experiment which anticipated the better known one of Sanctorius. Erasistratus weighed a bird, put it into a pot and let it fast, then weighed it again together with its droppings and established that a considerable loss of weight had occurred (8). However, this achievement of Erasistratus was lost and did not enter the Greek legacy.

Nevertheless, the Greeks did contribute toward an eventual concept of metabolism. Nutrition was a subject of great interest in Greek medicine, since diet was the basis of therapy for the Hippocratic physician. What happened to the ingested food was described vaguely as *coction*, a process neither purely mechanical nor yet chemical although analogous to digestion by heat. Furthermore, there are several passages in the Hippocratic writings which compare the action of air on blood to its effect on fire. Of interest in this connection is the Hippocratic aphorism (2 [p. 105]) which states that "growing creatures have most innate heat, and it is for this reason that they need most food, deprived of which their body pines away. Old men have little innate heat, and for this reason they need but little fuel: much fuel puts it out. For this reason too the fevers of old men are less acute than others, for the body is cold."

GALEN

Following his master Hippocrates, Galen devoted considerable attention to the physiology of nutrition and developed a theory of the nutritive process. He recognized that nutrition was not a simple process and analyzed it into the three stages: application (*prosthesis*), adhesion (*prosphysis*), and assimilation. As he formulated it in his treatise *On the Natural Faculties*, (9 [p. 39]), nutrition is "an assimilation of that which nourishes to that which receives nourishment. And in order that this may come about, we must assume a preliminary process of adhesion, and for that, again, one of presentation. For whenever the juice which is destined to nourish any of the parts of the animal is emitted from the vessels, it is in the first place dispersed all through this part, next it is presented, and next it adheres, and becomes completely assimilated."

Galen was one of the first experimental physiologists, and his theory of nutrition is actually in a large sense a programmatic basis for research on the metabolic activities of the body. Indeed, he undertook experimental studies of the function of the kidneys, which he held was to separate out the urine and pass it into the bladder by way of the ureters; and also of the digestive processes, demonstrating that food remained in the stomach where it underwent digestion, that the digested material was then expelled through the pylorus by gastric peristalsis (9 [pp. 239–245]). Despite his outstanding ability and achievements, however, Galen could not transcend the technical and theoretical limitations of his time. He had no means of solving physiologic problems which are basically chemical. The solution of these problems required a chemical physiology which did not begin to become available until the sixteenth century.

CHEMISTRY, TECHNOLOGY, AND MEDICINE

This development, so pregnant with significance for biology and medicine, was initiated largely by Paracelsus. It is not necessary for our purpose to dwell at length on the life and activities of this remarkable man who was regarded by most of his contemporaries as a charlatan and a vagabond, but who has risen to heroic stature in the perspective of time. For Paracelsus, alchemy—that is, chemistry—was one of the four pillars of medicine, and his physiologic doctrine was fundamentally chemical (10). Furthermore, he conceived of physiologic processes as governed by regulatory principles that he called *archaei*. Disease resulted when the *archaeus* did not govern the various processes properly, and death occurred when the *archaeus* was lost to the body. This concept of the organism as a self-regulating entity was a distinct contribution toward an eventual understanding of metabolic activity.

Paracelsus stands at the threshold of the modern period in science and medicine and his idea of a chemical physiology reflects some of the forces that brought this period into being and continued to influence its further development. While roots of modern science can be traced back into the medieval world, it was in certain European centers during the Renaissance that the Great Restoration was initiated. At the end of the fifteenth century, a movement of scientific inquiry became prominent in Italy, South Germany, and the rest of Central Europe, including Poland and Hungary. Later, the centers of this movement shifted from South and Central Europe to France, Holland, and England. The period of scientific advance thus initiated extended approximately to the end of the eighteenth century. It was during this period that the discoveries were made concerning the physical world and the human body which laid the basis for the formulation of a concept of metabolism during the nineteenth century.

The modern period in science and medicine

emerged out of the interaction of many forces. Economic, social, technologic, and intellectual factors reacted very intimately on one another. An exceedingly important part in this process of preparation was played by the technical revolution of the Middle Ages. Without the cumulative technologic progress of the preceding four centuries, the creators of modern science in the sixteenth century would very likely have been unable to achieve their aims. The development of mines, salt works, foundries, glass works, and other industrial enterprises had a special significance for the shaping of a new intellectual climate in which science would develop (11, 12). The invention of printing made it possible to emancipate such practical knowledge from the tradition of secrecy, so as to extend and improve it.

Moreover, there were certain other factors at work which tended to operate in the same direction. Increasing wealth of cities and provinces, reviving secular interests, and the development of a new social order based on commerce, money, and credit provided a favorable setting for the progress of industrial technology and the creation of new concepts concerning natural phenomena. Desire for wealth as the sinews of war and an appreciation of the utility of technology in achieving power led rulers and statesmen to encourage men of inventive ingenuity and technical knowledge.

At the same time academically trained men began to interest themselves in the technical activities of craftsmen. This is clearly evident in William Gilbert's treatise on the magnet, where he shows a knowledge of mining, forging, and navigation derived not from learned literature but from miners, foundry men, and navigators (13). These developments are also reflected in the thought of Paracelsus where his knowledge of chemistry acquired by working in mines and smelters is applied to problems of biology and medicine.

THE QUANTITATIVE APPROACH

Natural science during this period was characterized not only by growing use of the experimental method, but also by a disposition to treat natural phenomena quantitatively. This trend also found expression in medicine. At Padua, the quantitative study of the body and its functions was actively pursued by Santorio Santorio. He adopted Galileo's thermometer to clinical purposes and used a pulsimeter to measure the pulse beat. Best known, however, are his painstaking experiments to record variations in his weight under all sorts of conditions. The purpose of these experiments was to determine what happened to foods in the body. Santorio weighed his food intake, his excretory output, and his body during digestion, but all that he was able to determine was that a certain quantity of the food was "lost" through "insensible perspiration." Santorio had taken up the problem where Erasistratus had left it, but he was unable to advance it significantly.

Despite the fact that Santorio found himself in a blind alley, the quantitative approach to metabolism and nutrition was continued by other investigators. In the seventeenth century, Denis Dodart, a French physician, undertook similar observations; and in the eighteenth century the ill-starred physician, William Stark, tried different diets on himself with the result that after eight months he died of scurvy (14). These investigations, however, were unable to advance fundamentally the understanding of metabolic activities without a corresponding development of general science. To render comprehensible the processes of respiration, digestion, absorption, tissue utilization, and excretion, chemistry and physics had to develop.

THE PROBLEM OF RESPIRATION

The problem of respiration was actively pursued during the seventeenth and eighteenth centuries. The work of Paracelsus was extended and developed by Jean Baptiste van Helmont (15 [pp. 130–140]). He created the concept of and the term for *gas* and discovered carbon dioxide, a basic gaseous product of metabolism, which he called *gas sylvestre*.

Like Paracelsus, he postulated a regulatory principle in the body that governed its functions and which he called *Blas* or *archaeus*. van Helmont believed that this principle acted by making use of fermentation processes, and based his physiologic doctrine on a theory of fermentations. He divided the process by which dead food becomes living, active flesh into six stages. The first is digestion in the stomach, and van Helmont gave an exposition of peptic digestion which comes close to our present ideas. The second digestion occurs in the duodenum, the ferment being furnished by the bile. The third digestion is sanguification by which the digested food is converted into blood, crude blood, of which a part is later used to form urine and sweat. The fourth digestion takes place in the heart and arteries where the dark blood of the vena cava becomes lighter. The fifth digestion changes "the blood of the arteries into the vital spirit of the *archaeus*." Finally, according to van Helmont, "The sixth and last digestion takes place in the kitchens of the several members, for there are as many stomachs as there are nutritive members. In this sixth digestion a spiritus, a ferment innate in each place, cooks its food for itself." Evidently, we have here an anticipatory intimation of tissue metabolism.

A number of important contributions to the problem of respiration were made during the seventeenth century by members of the group of amateur scientists who eventually became the Royal Society (15 [pp. 177–182]). Robert Boyle showed that in a vacuum the flame of a candle or the life of an animal was extinguished. He demonstrated further that in a sealed vessel, animals die after about half an hour,

because they have exhausted part of the air which is necessary for life. Boyle thus showed that the change effected by breathing was identical with that which occurred when a candle burned, and that it was dependent on some component of the air.

Robert Hooke, curator of experiments to the Royal Society, took the next step and by means of a series of experiments showed clearly that the respiratory movements were not essential for respiration. What was essential was the entry of air into the lungs. Hooke's experiment on artificial respiration provided the point of departure for still another important contribution to the problem by Richard Lower, also a member of the Royal Society. He showed that the dark color of venous blood is changed into the bright red of arterial blood not in the heart, but in the lungs through contact with air. Furthermore, Lower drew the conclusion that the change in color was due not alone to exposure, but to the fact that the blood took up some of the air (16 [pp. 14–19])

Despite the promise of these observations, however, no further advance was made, and the problem of respiration was not solved until the end of the eighteenth century. In 1757, Joseph Black, Professor of Medicine at Edinburgh, rediscovered van Helmont's *gas sylvestre* as "fixed air" and proved it to be present in expired air. The Swedish apothecary, Carl Wilhelm Scheele, discovered oxygen, which he called "fire-air" in 1772, and two years later, Joseph Priestley, dissenting clergyman, scientist, and political philosopher, found it independently and called it "dephlogisticated air." Because of their adherence to the phlogiston theory of combustion, these men could not see the significance of their discoveries for respiration. According to this theory, combustion was due to the presence in all matter of an element called phlogiston.

LAVOISIER AND SUCCESSORS

A correct interpretation of these discoveries was achieved, however, by their contemporary, the French scientist who became the father of modern chemistry, Antoine Laurent Lavoisier (16 [pp. 19–30]). As early as 1775, he realized the significance of the discoveries of Priestley and Scheele. Discarding the phlogiston theory, Lavoisier began to see the relationship between inspired oxygen and expired carbon dioxide. He realized that respiration was a combustion process, in which oxygen was burnt in the body to carbon dioxide and water, and that this process was the source of animal heat.

In 1780, Lavoisier, working with the mathematician Laplace, determined oxygen intake and carbon dioxide output in guinea pigs and established the relationship between these phenomena, what today we would call the respiratory quotient. Later he undertook calorimetric studies of animals, and in 1789 crowned his work by determining oxygen consumption in man at rest, and the increase that resulted from ingestion of food, work, and cooling of the body. Lavoisier also intended to study digestion and the composition of the blood, but his untimely death brought this truly revolutionary contribution to an end. There were others, however, to carry on.

Lavoisier had erroneously assumed that oxidation occurs in the lungs, but in 1791 Lagrange pointed out that this was incorrect and that it occurs during the passage of the blood from the arteries to the veins. At the same time, the Abbé Spallanzani had been carrying on experiments on respiration. From these he drew the far-reaching conclusion that ultimately the tissues respire (17). This view was not accepted, however, even when it was presented in 1823 by W. F. Edwards in a more complete form. Not until 1837, when Gustav Magnus, using the mercurial blood pump, definitely proved that oxygen is transported by the blood to the tissues and carbon dioxide carried back to the lungs, did the theory of respiration assume its present form. Knowledge of oxygen transportation in the blood was further advanced by Berzelius who, in 1838, recognized the function of the red blood corpuscles, by Liebig who advanced the hypothesis that oxygen combined with some form of iron, and by Hoppe-Seyler's discovery of hemoglobin in 1862, thus confirming this hypothesis.

USE OF FOOD BY THE BODY

While one fundamental metabolic activity had been elucidated by Lavoisier and his successors, there still remained the problem of the fate of foods in the body. It was necessary to determine the composition of foods, to establish how they are changed during digestion, where these changes occur, how and in what form the products of digestion are absorbed and circulated throughout the body, how they are transformed in the tissues, how much energy they produce, and in what form they are excreted. To deal with these questions, a new science, organic chemistry, had to develop, and this was produced during the nineteenth century. Chemistry, far more than physics, was the dominant science of the period, and its most important representative in the area with which we are concerned was the German scientist, Justus von Liebig, for it was he who created a unified concept of metabolic activity.

Various organic compounds had been discovered and studied prior to Liebig. For example, Scheele in 1776 had discovered uric acid and lactic acid. Urea had been found in the urine by Rouelle in 1773. Wöhler had prepared urea from ammonium cyanate in 1828, and by the end of the thirties leading chemists had come to recognize that there was nothing fundamentally different or mysterious about the chemistry of living matter.

Liebig developed these beginnings, put them on a solid theoretical foundation, and in general undertook to elucidate the main chemical cycles of living

matter. His influence on nutrition and nutritional chemistry was far-reaching. Liebig classified the nourishment of animals and men into three fundamental categories: protein, carbohydrate, and fat, and showed how protein was used to build up or repair the organism while the last two were used for fuel. He determined how much oxygen was needed to burn the different classes of food and how much energy was released as measured by heat. Carl Voit, writing in 1865, described his teacher's work in these terms (17 [p. 46]): "Liebig was the first to establish the importance of chemical transformations in the body. He stated that the phenomena of motion and activity which we call life arise from the interaction of oxygen, food and the components of the body. He clearly saw the relation between metabolism and activity and that not only heat but all movement was derived from metabolism. He investigated the chemical processes of life and followed them step by step to their excretion products."

While Liebig was carrying on his fundamental researches, the work of Lavoisier on the source of animal heat was being extended in France. Dulong and Despretz carried out investigations on animal calorimetry and published essays on the subject in 1823, but added nothing new. More significant were the experiments reported by Boussingault in 1839. He established the first balance between the carbon, hydrogen, oxygen, and nitrogen in the ingested food and in the excreta of animals, and compared actual carbon dioxide production with that which had been calculated. In 1849, Barral undertook to apply the principles of Boussingault's method to the analysis of human metabolism. Using a special closed apparatus, Regnault and Reiset in the same year measured the respiratory quotient of different animals and endeavored to see how it was influenced by various foods. Combining the methods of Boussingault and Barral, and Regnault and Reiset, Bidder and Schmidt at Dorpat endeavored to obtain a total picture of the metabolism of an organism. Their results were published in 1852 in an important book entitled *Die Verdauungssäfte und der Stoffwechsel.* They worked with cats, but the experiments undertaken between 1866 and 1873 by Carl Voit and Max von Pettenkofer in the respiratory apparatus constructed by the latter were carried out on human beings.

In his necrology of Pettenkofer, Voit gave his description of some of the results they obtained (17 [p. 72]): "Imagine our sensations as the picture of the remarkable processes of metabolism unrolled before our eyes, and a mass of new facts became known to us! We found that in starvation protein and fat alone were burned, that during work more fat was burned, and that less fat was consumed during rest, especially during sleep; that the carnivorous dog could maintain himself on an exclusive protein diet, and if to such a protein diet fat were added, the fat was almost entirely deposited in the body; that carbohydrates, on the contrary, were burned, no matter how much was given, and that they, like the fat of the food, protected the body from fat loss, although more carbohydrates than fat had to be given to effect this purpose; that the metabolism in the body was not proportional to the combustibility of the substances outside the body, but that protein, which burns with difficulty outside, metabolizes with the greatest ease, then carbohydrates, while fat, which readily burns outside, is the most difficultly combustible in the organism."

Voit's work, as carried on by his pupil Max Rubner in Germany and by his American pupils, W. O. Atwater and Graham Lusk, made it possible to study metabolic activities more precisely and to apply the results to clinical problems. Important in this respect are the contributions of Nathan Zuntz and his student, A. Magnus-Levy. The latter introduced metabolic studies of patients for diagnostic purposes, and in so doing also focused interest on the relations between metabolism and internal secretion.

From what has been said, it is clear that by the end of the nineteenth century and the early part of the twentieth century, research workers and clinicians were already operating with a fruitful concept of metabolism. At this point, therefore, let us stop and look back to discern the broad outlines of the process by which the concept had come into being. Within the limits of this analysis, it is neither possible to discuss all aspects of metabolism, nor is it necessary for our purpose. Our objective is to trace in broad outline the evolution of the concept of metabolism and this can be done on the basis of the material presented.

By the end of the eighteenth century and the early part of the nineteenth century, a concept of general metabolism had been developed and was available to biologists and physicians. Cuvier, for example, had a clear notion of the organisms taking in molecules with the food and rejecting others in the excretions, of the continuous motion of particles in the tissues, and of their combination and recombination. In his *Leçons d'anatomie comparée,* he wrote (18): "This general movement, universal in every part, is so unmistakably the very essence of life that parts separated from a living body straightway die." The organization of the body and the arrangement and interaction of its solid and liquid parts are adapted to further this *tourbillon vital.* "Each part contributes to this general movement its own particular action and is affected by it in particular ways, with the result that, in every being, life is a unity which results from the mutual action and reaction of all its parts" (19). Thus, it is no accident that the German term for metabolism, *Stoffwechsel,* was first used in 1838 by Gmelin.

However, this global concept had to be brought into contact with empirical and experimental data.

It was necessary to resolve vital activity seen as a whole into metabolic processes and to reduce vital happenings to the chemical and physical level. This was the achievement of the nineteenth and early twentieth centuries. The task of the period was to employ the methods handed down by Lavoisier and his contemporaries and to analyze step by step the observed vital activities. In the process new methods and new ideas were added from time to time and incorporated into the work of investigators to provide practical and intellectual tools for the solution of new problems. For example, outstanding work was carried out on the physiology of digestion, which made it possible to fill many gaps in the metabolic jigsaw puzzle. One need recall only the names of Réaumur, Spallanzani, Beaumont, Schwann, Bernard, and Pavlov in this connection. New concepts were created. The most fruitful of these was undoubtedly the *milieu intérieur* of Claude Bernard and its later development in Walter Cannon's idea of homeostasis.

SIGNIFICANCE OF HISTORY

The important point for us, however, is that these developments occurred on the basis of earlier ideas, observations, and experimental studies. It is in this sense that our present concept of metabolism is a product of historical development. Consequently, if we want to understand where we may be going in the future, this kind of historical perspective is needed. One cannot advance intelligently into the future without a willingness to look attentively at the past and appreciate its significance.

According to Francis Bacon, "Histories make men wise," whence it follows that a major purpose of studying history, though not the only one, is that it enables one to understand better the events and trends of a particular time. This does not mean, however, that historical study leads to omniscience. On the contrary, when properly studied and its results applied, history provides one with a salutory, critical point of view. The French historian, Louis Halphen, has remarked in this sense that while history does not turn people into sceptics, it does provide a wonderful schooling in prudence (20). Without proper criteria for evaluating information provided by others, we are apt to become victims of deceptions and errors. The proper study of history enables us to avoid such pitfalls.

Furthermore, although history makes its possible to understand how the present has evolved from the past, there is one thing that history cannot do. It cannot teach what to do in the future. We should not look back for solutions to present or future problems because we will not find them, but we can gain understanding of our situation and guidance in the realization of the values which it holds.

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Nutritive Value of Milk Unharmed by Pasteurization

Rat growth studies conducted at the University of Wisconsin have indicated that milk is milk, regardless of treatment. Certified milk, pasteurized milk, summer milk, and winter milk all produced similar growth in rats.

Satiety Values of Isocaloric Diets for Reducing

With Special Reference to the Glucostatic Theory of Appetite Control[1]

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THE triteness of repeating the statement that "obesity is caused by overeating" can be excused only by the frequency with which people in the active stage of obesity fail to understand the inviolability of the rule. It is, of course, true that positive caloric balance may be due to a reduction in energy output rather than to an increase in energy intake and that such a reduction may be secondary to metabolic disorders of various kinds. But such cases are rare in comparison to the vast number in which simple overeating is the etiologic factor.

Clinical experience with obese subjects has shown that while it is unusual indeed to be able to demonstrate metabolic defects by present methods and criteria, psychologic defects are evident in many subjects. These may be manifest as anxiety states or as frank mental ill health ranging from mild personality disorders to psychoneurosis and psychosis. This has led to a wide range of opinion as to the relative importance of such psychogenic factors as compared to physiologic factors in the causation of obesity. Both may, of course, co-exist, representing one further example of the interdependence of psyche and soma. Whatever may be the modifying influence of the higher levels of the central nervous system, there is strong physiologic precedent for the existence of a self-regulating mechanism to maintain a balance between energy intake and output within broader or narrower limits. The fact that examples of the transient and relative failure of this system are so numerous in our communities in the form of the obese should not distract one from the much higher percentage of people who, without conscious effort, may maintain a given weight, within a few pounds, over many years if not over an entire adult lifetime.

This paper presents a brief review of current knowledge about the physiology of appetite and hunger[3] and reports an experiment in which an attempt was made to assess the satiety values of the energy-yielding nutrients and to relate the findings to the glucostatic theory of appetite control as proposed by Mayer and his co-workers (1–6).

THE LITERATURE

There is much evidence that the hypothalamus plays a vital part in the control of appetite. Hetherington and Ranson (7) showed that bilateral injury to ventromedial nuclei in the hypothalamus of rats produced animals in which there was apparent failure of the satiety mechanism leading to obesity. Subsequently Anand and Brobeck (8) produced

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[3] The terms "appetite" and "hunger" are used somewhat indiscriminately in this paper as their original context was in reports made by twelve experimental subjects whose interpretation of these two terms could be expected to differ. In general, "hunger" was used to express a more unpleasant and advanced "urge to eat" than "appetite," which represented a comparatively mild and almost pleasurable anticipatory sensation prior to meals. "Appetite," if unsatisfied, led to "hunger."

the opposite effect, animals which died of inanition in the presence of plenty, by the bilateral destruction of nuclei lateral to those injured by Hetherington and Ranson. Strominger and Brobeck (9), elaborating on this work, have suggested that the neural basis of feeding is a pattern of nervous reflexes dependent on many afferent stimuli, with the hypothalamus acting in the facilitatory manner assigned to it by Magoun (10). Such afferent stimuli might come from various areas of the cortex, such as those subserving the sense organs, but it is apparent that there must also be a source of "information" as to recent food intake in order to explain the rapid inhibition of appetite or hunger following the eating of an adequate meal.

A mechanism by which the hypothalamus is sensitive to some humoral factor, presumably either a specific nutrient or a product of intermediate metabolism, has been postulated. The logical first thought was that this humoral factor might be the blood glucose level. However, no direct and constant relationship between this and subjective hunger or appetite has been proved. Furthermore, there was the anomaly of the hungry diabetic person. Mayer (1–3), therefore, suggested that the hypothalamic "receptors" might be sensitive not to the absolute blood glucose level but to the "available" blood glucose as measured by the arterio-venous glucose difference, or delta (Δ) glucose, in accordance with the work of Foster (11) and Himsworth (12). According to this theory, the high absolute blood glucose level of the uncontrolled diabetic person might be accompanied by comparatively low intracellular availability due, perhaps, to a defect in the phosphorylation mechanism. The work of Van Itallie, Beaudoin, and Mayer (4) supports this contention. Work has also been done on Houssay animals, alloxan diabetes in rats, and the hereditary obesity-diabetes syndrome in mice (5, 6). In normal subjects Van Itallie, Beaudoin, and Mayer claimed to have found a correlation between Δ-glucose levels and subjective desire for food, a Δ-glucose approaching zero usually being associated with hunger while this was never reported with a Δ-glucose in excess of 15 mg. per 100 ml.

Brobeck (13) has postulated that the hypothalamic centers are sensitive, not to any circulating nutrient or metabolite, but to thermal influences as manifest, for instance, by the specific dynamic action of foods. Experimental evidence, apparently incompatible with such a "thermostatic" theory, has been produced, notably by Mayer and Greenberg (14), who showed that the central temperature of hyperphagic animals is higher than that in controls. Furthermore, deprivation of food for a short period of time increased the central temperature in intact animals. Such a theory would also leave unexplained the hyperphagia sometimes seen in hyperthyroidism.

Many workers have investigated the patterns of absolute blood glucose levels after eating and have attempted to relate them to the subjective state. Thorn *et al.* (15) found that hunger and weakness, associated with relative hypoglycemia, occurred in a normal subject in 1 to 2 hr. after the ingestion of a breakfast high in carbohydrate but low in protein and fat, but the symptoms were delayed 2 hr. when an isocaloric high-fat, low-protein, low-carbohydrate breakfast was substituted. An isocaloric breakfast high in protein and low in carbohydrate and fat was followed by an improved sense of well-being and no symptoms of hypoglycemia in 5 hr.

Haldi and Wynn (16), working with fifty-nine normal healthy young adults, compared absolute blood glucose levels 2½ to 3 hr. after the ingestion of isocaloric breakfasts of low and high carbohydrate content and found no significant difference; neither did they find any relationship between blood glucose level and subjective symptoms of weakness or hunger. On the other hand, Orent-Keiles and Hallman (17), using six or seven adult women, related post-prandial blood glucose curves to eight differently constituted breakfasts and found that the return of the blood glucose to fasting level was delayed by breakfasts containing 22 gm. protein compared to isocaloric meals of lower protein content. They also found that the breakfast meal may influence blood glucose levels during the afternoon, and they related the rate of fall of levels after a standard luncheon to the caloric value and protein content of various preceding breakfasts.

Bryant *et al.* (18), using normal subjects in two age groups, found that the post-prandial rise in blood glucose level following breakfast was significantly prolonged by increasing the amount of protein in the meal and that protein of plant origin was as effective as animal protein in producing this effect.

PLAN OF PROCEDURE

Subjects

The experimental group consisted of twelve adult men in the age range, nineteen to twenty-nine years. Eleven were at least 20 lb. above their "ideal" weights as determined by the Metropolitan Life Insurance Company tables (19), the one exception being 17 lb. above "ideal" weight. All were in good general health.

Experimental Phases

The main experiment lasted nine weeks divided into three three-week phases. Each three-week phase represented a period of adaptation to a particular diet, the three diets used being isocaloric but containing varying proportions of the energy-yielding nutrients. An additional phase of one week, using a maintenance diet and a different group of subjects, is reported separately below. Throughout the experiment, the subjects ate almost all their meals at a

diet table under skilled supervision. Only occasional meals away from the table were permitted during the first part of each phase, the subject being asked to conform to the general dietary plan when eating elsewhere. The subjects were asked to take no between-meal snacks, and there was evidence that the degree of cooperation was high.

Throughout the experimental period the subjects kept diaries in which were recorded subjective sensations allied to appetite. These refer largely to degrees of between-meal "hunger" on arbitrary scales but have enabled some estimate to be made of the relative satiety value of the diets used.

At the end of each phase the subjects were confined to a metabolic unit for 24 hr. during which time venous and capillary blood samples were taken for the determination of blood glucose levels. During such days, the diet taken conformed to the schedule in force during the preceding three weeks. The first blood sample was taken before breakfast following a controlled overnight fasting period, further samples being taken as follows: 60, 105, 165, and 225 min. after breakfast; 75, 135, 195, and 255 min. after lunch; and 90, 150, and 210 min. after supper. At the first eight sampling times paired samples of venous and capillary blood were taken for the determination of the capillary-venous glucose difference. This has been found to be virtually identical with the arterio-venous glucose difference, or Δ-glucose (20). While in the metabolic unit, the subjects' physical activity was restricted to movement among the rooms in use, which were adjacent.

Additional Phase Using 3000-Calorie Diet

To compare the glucose response to a maintenance diet as opposed to the reducing diet of Phases 2, 3, and 4, an additional phase was added in which a 3000-calorie diet was used. This phase lasted for one week, at the end of which blood samples were obtained as previously. Because many of the original subjects were no longer overweight at the end of the main project, twelve new subjects were recruited, an attempt being made to produce matched pairs with the first group with regard to ideal weight and percentage overweight. Eight subjects of the second group were close matches of their counterparts, the other four being somewhat lighter in weight but still at least 20 lb. above ideal weight. The mean height and weight for the second group was 71 in. and 202 lb. compared to 71 in. and 211 lb. for the first group.

TABLE 1

Details of diets by experimental phases

PHASE	CALORIES	PRESCRIPTION			CALORIES FROM		
		Protein	Fat	Carbohydrate	Protein	Fat	Carbohydrate
		gm.	*gm.*	*gm.*	*%*	*%*	*%*
2	1800	115.7	102.8	103	25.7	51.4	22.9
3	1800	115.7	50.0	222	25.7	25.0	49.7
4a	1800	35.0	102.8	183.7	7.8	51.4	40.6
4b	1800	58.0	102.8	160.6	12.9	51.4	35.7
5	3000	100.0	115.0	388.0	13.5	35.0	51.5

Diets

Details of the diets used in each experimental phase are given in Tables 1 and 2. With the exception of the diet used in Phase 5, all were isocaloric at a level of 1800 calories per day. The diets used may be identified in a purely relative sense as the low-carbohydrate diet (No. 2), low-fat diet (No. 3), low-protein diet (No. 4a), moderate-protein diet (No. 4b), and the 3000-calorie diet (No. 5). It will be noted that during Phase 4, the experimental group was split into two sub-groups of six persons each. The relative proportion of calories and of carbohydrate, fat, and protein fed at each meal was constant throughout all phases. However, these were not divided equally among the three meals as can be seen from Table 2. This was done so that the meals might be somewhat similar to those used in a normal regimen.

Methods

Blood glucose determinations on venous and capillary samples were carried out within a few hours by a modification of the Folin-Malmros method as adapted by Horvath and Knehr (21). Slight modifications were made since it was found that more consistent results were obtained by using 1 ml. potassium ferricyanide solution instead of the 2 ml. used in the original method. Duponal ferric iron was used instead of gum ghatti ferric iron in later determinations because of its easier preparation.

RESULTS

Satiety Value of Diets

A comparison of the satiety values of the three main types of reducing diets used was made possible by an examination of the day-to-day diaries kept by the subjects and of an over-all appraisal written by them at the end of the project. These findings are summarized in Table 3.

Of the twelve subjects in the experimental group, two made no adequate assessments of satiety values and two ranked all three diets equal in this respect. Of the remaining eight subjects, five ranked the low-carbohydrate (No. 2) first for satiety value, two ranked the low-fat diet (No. 3), and one the low-

TABLE 2

Approximate division of nutrients between meals (constant for each phase)

	CALORIES	PROTEIN	FAT	CARBOHYDRATE
Breakfast	1/4	1/5	1/4	1/3
Lunch	1/3	2/5	1/3	1/4
Dinner	5/12	2/5	5/12	5/12

protein diet (No. 4) first in this respect. Six of these eight subjects ranked the low-protein diets last. In general, the difference between the diet low in carbohydrate (No. 2) and that low in fat (No. 3) was not great. However, comments made about the satiety value of the low-protein diets (No. 4a and 4b) at both levels of protein intake used were stronger. Four individuals were particularly incisive in their complaints of being continually hungry.

Blood Glucose Response

Capillary Blood. The mean capillary blood glucose levels for all diets are shown in Figure 1. The fasting blood glucose levels varied in the range 82 to 92 mg. per 100 ml., the maximum difference not being statistically significant at the 5 per cent level of probability. Breakfast produced a rise in blood glucose level ranging from 13 to 32 per cent of the fasting level at 1 hr. after the commencement of the meal. The subsequent fall reaches fasting level in only one instance before the mid-day meal. The rise in blood glucose after lunch appears to be slightly higher than that after breakfast, but in fact no comparison is possible since there is a 15-min. difference in the elapsed time between eating the meal and taking the blood sample. This underlines the important fact that the points plotted as peaks and troughs on the blood glucose curves are not necessarily true maximum and minimum values, since blood samples were taken only at relatively long intervals (approximately every hour). Any small difference among diets in the rate of development of the maximum post-prandial blood glucose level would not be detected. Since the blood glucose level is being followed throughout a prolonged period, however, and the time intervals between blood samples are held constant for all diets, the data are valid for comparisons among diets although not for comparisons among meals. The rise in capillary blood glucose levels after supper was strikingly greater than that following the preceding meals, and this was a constant observation for all diets. This effect was probably due mainly to the fact that supper had the highest calorie component of the three meals and also the greatest proportional carbohydrate component (Table 2).

The data on capillary blood glucose levels were subjected to statistical analysis, and the variation among diets was shown to be significant at the 5 per cent probability level. There is no apparent consistent relationship, however, between the mean capillary glucose responses and any single dietary component. Thus, whereas the diet with the lowest ranked mean capillary blood glucose level is also lowest in over-all carbohydrate content, the diet with the second ranked mean capillary blood glucose level has the highest over-all carbohydrate content.

It is of interest to note that on a 3000-calorie intake, the mean fasting capillary blood glucose level was of the same order as those which occurred on the 1800-calorie diets and the post-prandial rise is in all instances exceeded by that of one or more of the reducing diets. This is a clear manifestation of increased blood glucose tolerance with a higher caloric intake. The one apparent difference between the two levels of caloric intake appears to be in the duration of the elevation of capillary blood glucose level after breakfast and after lunch, the higher intake being associated with a more prolonged elevation as one would expect.

Venous Blood. The mean venous blood glucose levels for all diets are shown in Figure 1. The variation between absorptive and postabsorptive states is considerably less than that occurring in the capillary blood so that the curves are flatter. On two diets a fall rather than a rise occurred in the mean venous blood glucose level after eating breakfast, and this was seen to happen in fourteen out of the forty-eight individual venous blood glucose curves obtained (29 per cent). This was a constant finding on all diets for two of the subjects. In these cases peripheral utilization of glucose apparently out-

TABLE 3

*Subjective response to reducing diets**

DIET	RANKED CHOICE OF DIETS FOR SATIETY VALUE		
	First	Second	Third
Low-carbohydrate (No. 2)	5	3	0
Low-fat (No. 3)	2	4	2
Low-protein (No. 4)	1	1	6

* NOTE: Two subjects ranked all three diets equal; two subjects made no adequate assessments.

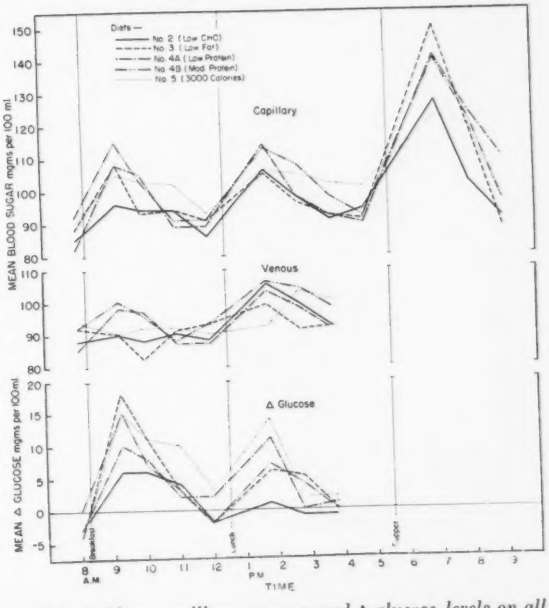

FIG. 1. *Mean capillary, venous, and Δ-glucose levels on all diets.*

strips the increased supply during the absorptive period.

Statistically, the differences in mean venous blood glucose levels among diets were not significant at the 5 per cent probability level, and no meaningful relationship of mean venous blood glucose levels with individual dietary components is apparent.

Capillary-Venous Difference or Δ-Glucose. The mean Δ-glucose values for all diets are shown in Figure 1. They demonstrate a consistent rise and fall coincident with the absorptive and postabsorptive states, although the differences among diets are considerable, being significant at the 1 per cent probability level.

The height of the rise in mean Δ-glucose after meals is not consistently related to any single dietary component, but the 3000-calorie diet (No. 5) appears to have maintained a higher level, especially about 3 hr. after eating, and it has the highest ranked mean. Conversely, the diet low in carbohydrate (No. 2) has a comparatively low mean and is ranked last among the five diets. It is noticeable that on this diet, the rise in mean Δ-glucose after lunch was comparatively slight, although this was not associated with any decrease in its satiety.

Examination of the glucose responses of individuals revealed considerable variation of pattern. In some instances, the capillary glucose level 1 hr. after eating would be almost back to fasting level, but this finding was commonly associated with a fall of the venous glucose below fasting level, thus establishing a rise in the Δ-glucose. Many individual instances of low or negative Δ-glucose levels unassociated with any subjective sensations of appetite or hunger were noted. Also, the converse, hunger coinciding with a substantial Δ-glucose level, occurred in two individuals during the low-protein regimen.

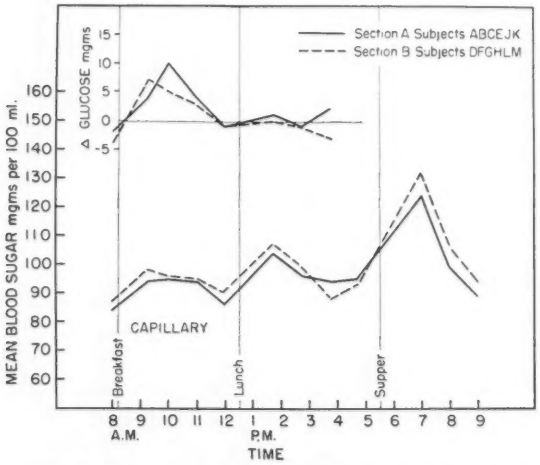

FIG. 2. *Comparison of mean capillary and Δ-glucose levels for two sub-groups of six subjects on a low-carbohydrate diet.*

Comparative Aspects of Results

Differences in glucose responses to the various diets at the twelve individual sampling times were tested for statistical significance by Duncan's procedure. It was shown that significant differences in capillary and Δ-glucose levels appeared mainly in samples taken at the height of the absorptive period and in general became significant at a 1 per cent probability level only after supper; this being the largest meal of the day, it would be expected to exaggerate any differences due to the diets themselves.

If the mean capillary and Δ-glucose curves for the two sub-groups of subjects on diet No. 2 are superimposed, as in Figure 2, it becomes apparent that there was a remarkable homogeneity of response between the sub-groups. This was also true for diet No. 3. This observation encourages the belief that the mean glucose responses from which conclusions have been drawn were typical of those which would be expected from the population sampled. Variation among subjects was, however, considerably greater for one sub-group than for the other. Direct statistical comparison of the blood glucose responses to diets No. 4a and 4b is, therefore, avoided since effects due to groups and diets would be indistinguishable.

Loss of Weight by Subjects

The loss of weight by the subjects was entirely incidental to the main purposes of the study. However, examination of the data on this aspect presented in Figure 3 shows several features worthy of comment. During an initial period of one week on a 3000-calorie diet, a phase not ultimately included in the over-all experimental period, all the subjects but one (Subject *L*) lost weight, the mean individual loss being 2.8 lb. Throughout Phase 2 on the low-carbohydrate diet, weight was lost by the group as a whole at a steady rate of about 3.4 lb. per week. However, during the first week on the low-fat diet (No. 3), there was a marked reduction in weight loss.

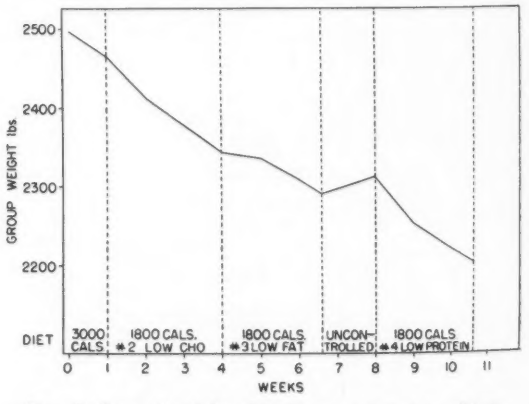

FIG. 3. *Loss of weight of twelve experimental subjects*

This was uniform throughout the group, the maximum individual loss being 1.75 lb., the maximum gain, 0.75 lb., and the mean loss 0.6 lb. The weight loss curve steepens again during the second and third weeks, but the weekly loss was, in general, less than on the other diets.

The most likely explanation for this would seem to be water retention, but no lengthy discussion of possible causes is thought justified here. Between Phases 3 and 4, a period of ten days was spent away from the diet table which resulted in a gain in group weight of 20½ lb. This was, in fact, due solely to five of the twelve subjects who gained considerably. However, the same subjects also lost weight rapidly on returning to the diet table, and water retention and loss would again seem to be the most probable cause. Two subjects commented on a diuresis during their first few days back at the diet table.

The mean individual loss of weight during the nine weeks on 1800-calorie diets was 23.6 lb. or 2.6 lb. per week. Assuming that an allowance of about 3200 calories a day would be reasonable for the age group represented by the experimental subjects, the 1800-calorie diets represented a daily deficit of 1400 calories which, on theoretical grounds, would lead to a weight loss of 2.8 lb. per week. It is suggested that the close coincidence of observed and theoretical weight losses provides objective evidence of a high degree of group cooperation in adhering to the diet.

DISCUSSION

Because of the unquantifiable nature of hunger or appetite in man, the assessment of satiety values presented in Table 3 is necessarily only a crude indication of any differences among the diets used. However, there does seem to be reasonable evidence that the protein component of a diet is more important than either fat or carbohydrate components in satisfying appetite, at least in the critical situation of a caloric deficit. This observation is in agreement with the findings of Thorn *et al.* (15) and Orent-Keiles and Hallman (17). These investigators, and also Bryant and her co-workers (18), attempted to associate the satiety effect of the protein content of the breakfast meal with a delay in the return of absolute blood glucose to fasting levels. However, acceptance of the conclusions of these workers is considerably prejudiced by the lack of adequate statistical evaluation of their results. Furthermore, accumulated experimental evidence is against the controlling humoral factor being the absolute blood glucose level as opposed to the available blood glucose level (as evidenced by the Δ-glucose). In general, therefore, attempts to explain the phenomenon of the apparent satiety effect of protein have been based on two assumptions: (a) that appetite is in some way regulated by changes in absolute blood glucose levels or in the Δ-glucose level; and (b) that the process of neoglucogenesis from protein sources would provide a more prolonged elevation of either absolute blood glucose levels or of Δ-glucose levels than would the breakdown of a comparable amount of carbohydrate. Neither our results nor those of Haldi and Wynn (16) confirm either of these assumptions.

Examination of the data for Subjects *F*, *J*, *H*, and *M* further emphasizes the lack of positive correlation between glucose response and satiety. These were four men whose hunger on the low-protein regimen was most marked, but who found that in general the low-carbohydrate diet left them with only normal appetite between meals. As can be seen from Figure 4, the glucose responses were appreciably greater on the diet of low satiety value at all times when, in the over-all study, differences among diets were found to be of statistical significance, that is, during the absorptive period.

It is to be expected that psychologic factors will play a part in determining the satiety value of any diet. The common sources of first-class protein, such as meat, eggs, and milk, occupy a prominent place in the daily dietary of a majority of the population of the United States. The sudden elimination of a substantial proportion of such foods from the diet would be likely to lead to a lack of "satisfaction" at the time meals were eaten, if not to the appearance in the post-prandial period of subjective sensations indistinguishable from hunger or appetite caused by any physiologic mechanism. It seems unlikely that psychologic factors alone could cause the quite marked loss of well-being and efficiency as well as the prolonged periods of between-meal hunger reported by several of the experimental group on the low-protein regimen, especially as the group was originally carefully selected with the aid of a psychologist to include only emotionally stable subjects

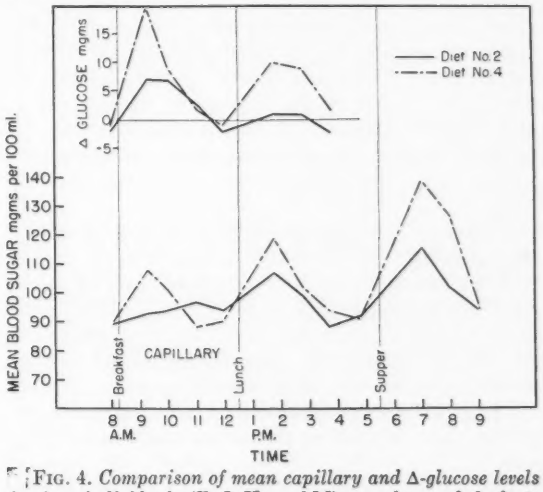

FIG. 4. *Comparison of mean capillary and Δ-glucose levels for four individuals* (F, J, H, *and* M) *on a low-carbohydrate diet and on low- or moderate-protein diets.*

likely to cooperate fully in the project. It is conceded, however, that the possibility of the so-called satiety value of protein being due entirely to psychologic factors has not been scientifically disproved.

If it is assumed that there are physiologic factors involved, then the implication is that the special contribution made to the satiety value of a diet by its protein component is due to the direct or indirect effects of some protein metabolite, or perhaps to the process of protein metabolism itself as evidenced, for example, by its specific dynamic action. Strominger and Brobeck (9) have suggested this as a possible factor. The present experiment has demonstrated that such effects are not associated with the changes in absolute blood glucose or in Δ-glucose levels which should occur if the regulation of appetite depended on a purely "glucostatic" mechanism. On theoretical grounds alone, protein would not be expected to contribute as much to the blood glucose as an equivalent weight of carbohydrate, and it does not appear to prolong the post-prandial elevation of blood glucose as had been postulated (*Fig.* 1).

Mayer and his co-workers (1–6) have demonstrated many instances of changes in appetite associated with hyperglycemia and hypoglycemia. The attractiveness of the glucostatic theory, as such, is undeniable providing, as it does, a link between the immediate supply of nutrients and the hypothalamus and safeguarding directly the essential metabolite of the central nervous system. Changes in blood glucose levels are, however, associated with complex parallel changes throughout the metabolic pool, and it would seem reasonable to postulate that it may be some individual metabolite or, better still, the over-all balance between metabolites within this integrated system, which provides the humoral mechanism controlling appetite through the mediation of the hypothalamic centers. Such a theory transfers the emphasis from blood glucose which stands, so to speak, on the carbohydrate portal of the metabolic pool, to the dynamic equilibrium existing on the "final common pathway" of metabolism and would adequately explain Mayer's findings while allowing for differential factors compatible with the apparent superiority of protein in providing satiety.

SUMMARY AND CONCLUSIONS

Twelve overweight subjects were fed isocaloric reducing diets in which the proportions of carbohydrate, fat, and protein were varied. After a three-week adaptation period to each diet, capillary and venous blood samples were obtained from each subject throughout a full day during which normal meals from the diet were eaten.

There was a marked reduction in the satiety value of the diets containing the lower protein components.

The mean capillary, venous, and Δ-glucose values resulting from the various diets are discussed and the effect on the glucose curves of increasing the calories from 1800 to 3000 a day noted.

No correlation was found between the capillary, venous, or the Δ-glucose levels and the satiety values of the diets used. On the contrary, the diet having the greatest satiety value produced the lowest mean blood glucose and Δ-glucose levels. Many individual instances were found of complete lack of hunger in the presence of negligible or even apparently negative Δ-glucose levels. Conversely, in two individuals, marked hunger occurred in the presence of substantial positive Δ-glucose levels.

No confirmation was, therefore, obtained for the "glucostatic theory" of appetite regulation, but it is suggested that the humoral mechanism controlling the appetite may depend on levels of individual metabolites or the over-all state of equilibrium on the "final common pathway" of metabolism.

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BIOGRAPHICAL NOTES FROM THE HISTORY OF NUTRITION

Ivan Petrovich Pavlov—September 14, 1849–February 27, 1936

Understanding of the processes of digestion was an essential step in the development of the science of nutrition. Reaumur (1683–1757) at the age of seventy showed that gastric digestion was a chemical process; Spallanzani (1729–1799) extended these studies on birds and on himself; Prout (1785–1850) showed the presence of free hydrochloric acid in gastric juice; Beaumont's (1785–1853) studies on Alexis St. Martin are familiar to all; and to Bernard (1813–1878) we owe our first knowledge of the action of the pancreatic juice. In 1902 the English translation of Pavlov's classic work *Lectures on the Work of the Digestive Glands* (published in Russia in 1897) opened up a new era of knowledge of the digestive processes. In order to understand digestion, Pavlov knew that he must devise experiments by which he could obtain digestive juices at all times in pure condition and while the gastro-intestinal tract was functioning normally in perfectly healthy animals. To achieve this he devised new and brilliant experimental techniques; the Pavlov pouch (a portion of the stomach isolated with its blood and nerve supply intact and with an opening through the abdominal wall) and his technique of "sham feeding" are among the well-known examples. F. G. Benedict who visited Pavlov's laboratories recalls that "the recovery rooms for animals were superior to similar rooms in any hospital of St. Petersburg at the time."

In recognition of this work, Pavlov was awarded the Nobel Prize in 1904. The work on digestion occupied the full time of Pavlov, his students, and associates from 1889 to 1902; then he turned his attention to the physiology of the higher nervous system and brought physiology and psychology together. His contribution to the knowledge of conditioned reflexes is familiar to students.

Ivan Petrovich Pavlov was born September 14, 1849, in the town of Ryazan in Central Russia. He was the son of an orthodox village priest and was educated in the religious seminary which earned him the right of admission to a university. He went to St. Petersburg where he graduated in 1875, and then went to the Military-Medical Academy as laboratory assistant and to study medicine. He obtained his medical degree in 1879 and did research on the physiology of blood circulation. He studied in Germany under Heidenhain and the great physiologist, Carl Ludwig.

In the beginning, Pavlov worked under every handicap of primitive facilities, no assistants, and having to use his own limited funds to pay for his research. However, by 1890, he could devote himself wholly to scientific work and became director of three laboratories in: the Institute of Experimental Medicine, the Military Medical Academy, and the Academy of Sciences.

Konorski, who worked in Pavlov's laboratory, described it as a "tumultuous beehive." Graduate students, doctors, and physiologists flocked to the laboratory, to learn his techniques and learn from him, for he was an excellent teacher.

Pavlov had a brilliant mind, great energy and enthusiasm, and exceptional memory, but he remained throughout his life a genuinely simple person. In 1881, he married Seraphima Vasilievna, a graduate of the Pedagogical Institute of St. Petersburg, who sacrificed all her personal interests for those of her husband and children—and her brilliant husband was not an easy man to live with. Pavlov died of pneumonia in February 1936 at the age of eighty-seven; only four days before his death he had been working all day in his laboratory.

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Blood Changes Following Breakfasts of Different Types

Blood Sugar and Chylomicrons in Young Women of Different Weights[1]

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TO PERSONS concerned with planning satisfying meals which are not too high in energy value, the response of subjects to isocaloric meals high in carbohydrate, protein, or fat are of special interest. This applies especially to the planning of breakfasts, which ordinarily supply only about one-fourth of the total daily caloric needs of normal persons, and to planning regimens for weight reduction. A satisfying meal prevents hunger sensations from occurring before the next meal. These sensations include the hunger contractions of the empty or nearly empty stomach and the tremulousness, faintness, weakness, or fatigue associated with a fall of 25 per cent or more in the concentration of blood sugar below the fasting level (1).

The experiments of Thorn, Quinby, and Clinton (2), carried out on only one male subject, involved the feeding of 400-calorie test meals high in carbohydrate, protein or fat. The results showed that 1 hr. after the high-carbohydrate meal, the subject's blood sugar rose to 100 mg. per 100 ml. from a preingestion level of approximately 85 mg. per 100 ml. and then fell to 69 mg. 2 hr. after the meal. This was a fall of 18.8 per cent. Simultaneously with the drop in blood sugar, the subject complained of hunger and weakness. The blood sugar then gradually returned to normal. Following the high-protein meal, the subject's blood sugar rose to 100 mg. per 100 ml. by the end of the second hour and did not fall below the fasting level until the sixth hour after breakfast. He did not complain of hunger throughout the experiment. After the high-fat meal, the blood sugar fell below the fasting level 2 hrs. after breakfast, but after 5 hr. it had fallen only 16.5 per cent. The subject experienced some symptoms of hypoglycemia, but they were not as pronounced as those following the high-carbohydrate meal.

The differences in results on the three types of meals used by Thorn *et al.* (2) can be explained by the differences in the rate of digestion of carbohydrate, protein, and fat and the differences in the capacity of each to form glucose. According to Longini and Johnson (3), the emptying time of the stomach is longer after a high-fat meal than after meals rich in carbohydrate or protein. Therefore, it would be expected that hunger contractions would be prevented longer by a meal high in fat. However, the fact that over half of the average animal protein eaten but only the glycerol portion of fat can be used to form glucose (4 [p. 386]) would explain why a high-protein meal would prevent hypoglycemic symptoms longer than one high in fat.

Orent-Keiles and Hallman (5) compared the changes in blood sugar following 500-calorie breakfasts containing approximately 16 gm. protein, 20 gm. fat, and 66 gm. carbohydrate with those following breakfasts containing 22 gm. protein, 26 gm. fat, and 50 gm. carbohydrate. After the breakfast containing 16 gm. protein, the blood sugar fell almost to the fasting level by the end of 3 hr., but after that containing 22 gm. protein, the blood sugar was maintained well above the fasting level for the same time. The breakfasts contained approximately 36 and 45 per cent of the calories in the form of fat.

For an American adult, a percentage of the total calories (as fat) below 30 could probably be considered low; between 30 and 40 per cent moderate, and 40 per cent or above high.

Breakfasts containing from 9.4 to 25.0 gm. protein

[1] Received for publication January 31, 1955.

[2] With the assistance of Dorothy U. Turner and Eleanore T. Schwartz.

and 26 to 45 per cent of the total calories (699 to 835) in the form of fat were used by Bryant *et al.* (6) in their study of the effect of the amount and type of protein on blood sugar values in young and old men. Ten gm. protein were insufficient to maintain the level of blood sugar at or above the fasting level 3½ hr. after breakfast, but 25 gm. were adequate in this respect.

Addison *et al.* (7), in studies on adult women, used breakfasts containing approximately 500 calories, 15 gm. protein, and 28 per cent of the calories in the form of fat. The breakfasts did not maintain the blood sugar at or above the fasting level for 3½ hr. after the meal, but the fall below the fasting level was not significant. The data suggested that, in women, 15 gm. protein in the breakfast are on the borderline with respect to maintaining the blood sugar at or above the fasting level for 3½ hr.

In the above studies the authors made no comments regarding the possible effect of the fat in the meals on the prevention of hunger symptoms.

In their studies of weight reduction in college women, Cederquist *et al.* (8) used 1500-calorie diets containing 100 gm. protein, 85 to 90 gm. carbohydrate, and 82 to 84 gm. fat (approximately 50 per cent of the total calories). On this type of diet, the subjects lost weight satisfactorily and reported a feeling of well-being and satisfaction. Hunger between meals was not a problem. A similar type of diet was used in the weight reduction studies of Young *et al.* (9, 10). These workers did not determine blood sugar but analyzed fasting blood samples for total lipid, phospholipid, and total cholesterol.

The present study was undertaken to verify the work of Thorn, Quinby, and Clinton (2) and to provide information on the response of subjects of different body weights to isocaloric breakfasts high in carbohydrate, protein, or fat. It was thought that such information would be of value in helping to understand some of the problems in the development of excess weight and in the planning of diets for both normal and overweight persons. Another purpose of the study was to obtain information on the nutritive value of breakfasts commonly eaten by college women and to determine whether the breakfasts eaten by the subjects weighing the most were different from those weighing the least.

PROCEDURE

The subjects for the study were twenty-four young women ranging in age from seventeen to twenty-nine years and weighing from 114.8 to 193.5 lb. In comparison with the Wood standards (11), the weights varied from −9.4 to +39.6 per cent.

The experiment was carried on for two years, beginning in the fall of 1950 and ending in the spring of 1952. For the tests, the subjects came to the laboratory at 7:30 A.M. A finger-blood sample was taken and then the test breakfast was eaten. Blood samples were again taken 30 min., 2 hr., 3 hr., and 4 hr. after breakfast. Chylomicron counts and glucose determinations were made on each serum sample. During the first year the subjects were instructed not to eat or drink anything except water after 8 P.M. until breakfast the following morning.

The results obtained on the fasting samples were found to vary somewhat according to the foods eaten before 8 P.M. Therefore, during the second year the subjects were given a standard supper at 5 P.M. and instructed not to eat or drink anything except water until the test breakfast.

Prior to or following the breakfast tests, the subjects kept records of all foods eaten for one week. The nutritive value of the breakfasts only, was calculated using figures from Agriculture Handbook No. 8 (12).

Test Breakfasts

The composition of the test breakfasts is given in Table 1. All three breakfasts contained approximately 450 calories. The high-fat breakfast contained 30.9 gm. fat (60.7 per cent of the total calories), 8.2 gm. protein, and 41.2 gm. carbohydrate; the high-protein breakfast 23.2 gm. protein, 19.5 gm. fat (38.9 per cent of the total calories), and 45.8 gm. carbohydrate; the high-carbohydrate breakfast 83.4 gm. carbohydrate, 7.5 gm. protein, and 11.1 gm. fat (22.0 per cent of the total calories). It will be noted that the high-fat and high-carbohydrate breakfasts each contained only about 8 gm. protein. They were planned as rather extreme examples of meals high in the respective nutrients. The high-protein breakfast was similar to the 500-calorie breakfast containing 22 gm. protein which was used by Orent-Keiles and Hallman (5) but it was moderate in fat content while theirs was liberal.

Blood Tests

Chylomicron counts and blood glucose determinations were used to indicate changes in the neutral fat and glucose content of the blood serum following the test breakfasts.

According to Gofman *et al.* (13), chylomicrons represent the S_f 40,000 fraction (flotation rate in the ultracentrifuge) of the blood lipoproteins. They are particles 35 mμ to 1 μ in diameter which contain small amounts of protein, phospholipid, and cholesterol and 75 to 85 per cent of neutral fat (4 [p. 471]).

While the present study was in progress, microchemical analyses for total fatty esters and chylomicron counts were made on blood serum samples from a few of the subjects at hourly intervals following the test meals. It was found that the changes in the concentration of fatty esters followed the same trend as those in the chylomicron counts. Therefore, it was decided that changes in the chylomicron counts could be used to indicate roughly the changes in the concentration of neutral fat. However, since chylomi-

TABLE 1
Composition of test breakfasts

FOOD	AMOUNT	APPROXIMATE MEASURE	CALORIES	PROTEIN	FAT	CARBOHYDRATE
High-Fat Breakfast						
				gm.	*gm.*	*gm.*
Orange juice, frozen	4 fl. oz.	½ c.	50	0.9	0.2	12.5
Shredded wheat biscuit	30 gm.	1	102	2.9	0.7	22.7
Light cream, canned	4½ fl. oz.	⅝ c.	306	4.4	30.0	6.0
Coffee	5 fl. oz.	⅔ c.				
Totals			458	8.2	30.9	41.2
Per cent of total calories*				7.2	60.7	36.0
High-Protein Breakfast						
Orange juice, frozen	4 fl. oz.	½ c.	50	0.9	0.2	12.5
Eggs, medium, boiled	96 gm.	2	154	12.2	11.0	0.6
White bread, toasted	46 gm.	2 slices	126	4.0	1.4	23.8
Butter	5 gm.	1 tsp.	33	0.0	3.8	0.0
Light cream, canned	½ fl. oz.	1 Tbsp.	30	0.4	3.0	0.6
Skim milk	5 fl. oz.	⅔ c.	58	5.7	0.1	8.3
Coffee	5 fl. oz.	⅔ c.				
Totals			451	23.2	19.5	45.8
Per cent of total calories*				20.6	38.9	40.6
High-Carbohydrate Breakfast						
Orange juice	4 fl. oz.	½ c.	50	0.9	0.2	12.5
White bread, toasted	69 gm.	3 slices	189	6.0	2.1	35.7
Butter	7 gm.	½ Tbsp.	50	0.0	5.6	0.0
Light cream, canned	½ fl. oz.	1 Tbsp.	30	0.4	3.0	0.6
Sugar	6 gm.	½ Tbsp.	24			6.2
Jam	40 gm.	2 Tbsp.	110	0.2	0.2	28.4
Coffee	5 fl. oz.	⅔ c.				
Totals			453	7.5	11.1	83.4
Per cent of total calories				6.6	22.0	73.6

* Using the values of 4, 9, and 4 calories per gram for protein, fat, and carbohydrate, respectively.

crons vary in size, the counts could not be used as a quantitative measure of the neutral fat contained in that fraction of the blood lipoproteins.

Recent studies (14, 15) have shown that the intravenous injection of heparin causes the disappearance of chylomicrons from the blood by changing them into lipoproteins of smaller size. Thus it seems possible that a "clearing factor" may exist in normal blood which brings about a change in blood fat prior to absorption into the tissues. However, Levy and Swank (16) have shown that there is no factor in normal dog plasma which has the ability to cause the disappearance of chylomicrons.

The chylomicron counts were made by a modification of the method of Becker, Meyer, and Necheles (17)[3] which involves the use of a microscope with dark field illumination.

The micromethod used for the determination of glucose in blood serum was an adaptation of the methods of Folin and Malmros (18), Horvath and Knehr (19), and Tabor (20).

[3] The details of the method used in making chylomicron counts will be published in a forthcoming bulletin of the Main Agricultural Experiment Station on micromethods for the determination of lipids in blood serum.

RESULTS

The results of the breakfast tests were analyzed in three ways: (a) by studying the data obtained for the entire group of twenty-four subjects; (b) by comparing the values obtained for the twelve heaviest subjects with those relating to the twelve lightest; (c) by comparing the values for the eight heaviest subjects with those for the eight lightest.

Results for the Entire Group

The results for the chylomicron counts and blood sugar tests following the three breakfasts are shown in top graphs of Figures 1 and 2 and in Table 2. As shown in Figure 1, Graph A, beginning at the second hour, the averages for the chylomicron counts were much higher following the high-protein and high-fat breakfasts than after the high-carbohydrate breakfast. The highest average count at the second hour was obtained following the high-protein breakfast. At the third and fourth hours, the highest average

TABLE 2

Average fasting values for chylomicron counts and blood sugar

GROUP	CHYLOMICRON COUNTS	BLOOD SUGAR
	no./field	*mg./100 mg.*
All subjects	10	95.6
12 subjects weighing the most	10	93.8
12 subjects weighing the least	10	97.4

counts occurred following the high-fat breakfast. Following all three breakfasts, the peaks in the curves came at the third hour, with a fall at the fourth hour.

In Figure 2, Graph A, the curve of average blood sugar values following the high-carbohydrate breakfast formed a sharp peak at ½ hr.; it then dropped below the fasting level at the third hour and rose almost to the fasting level at the fourth hour. Following both the high-protein and high-fat breakfasts, only a slight rise in average values occurred at ½ hr. After the high-protein breakfast the averages remained above the fasting level through the fourth hour. Following the high-fat breakfast, the average fell slightly below the fasting level at the second hour, remained below at the third hour, and rose slightly above the fasting level at the fourth hour. According to Snedecor's t test (21), the difference between the averages obtained at the second hour following the high-carbohydrate and the high-fat breakfasts was significant at the 5 per cent level; the difference at the third hour was significant at the 1 per cent level.

The subjects, especially the heavier ones, made the most complaints about being hungry following the high-carbohydrate breakfast. The high-protein breakfast seemed to be generally the most satisfactory for preventing hunger.

12 Heaviest Subjects vs. 12 Lightest

The twelve subjects in the heaviest group ranged in total body weight from 135.1 to 193.5 lb. Only eight, however, were more than 10 per cent overweight according to the Wood standards (11). The weights of the other four ranged between −3.4 per cent and +9.5 per cent of the standard. The twelve subjects in the lightest group ranged in total weight from 114.8 to 134.0 lb. In comparison with the Wood standards (11), they ranged between −9.4 and +13.9 per cent of normal. The subjects were divided into the two groups to show whether differences in response to the different breakfasts might be attributed to total body weight. Also, the authors wished to determine whether any of the three 450-calorie breakfasts would maintain the blood sugar of the heaviest subjects throughout the morning.

Comparisons of results for the twelve heaviest subjects with those for the twelve lightest subjects are given in Figures 1 and 2, Graphs B, C, and D, and in Table 2.

High-Carbohydrate Breakfast. As shown in Figure 1, Graph B, the curves for the average chylomicron counts were almost identical for the heavy and light subjects. However, as indicated in Figure 2, Graph B, the average blood sugar values showed more striking differences, especially ½ hr. and 3 hr. after breakfast. By the t test (22), there was a significant difference at the 5 per cent level between averages at ½ hr.; but the difference between averages at the third hour was not statistically significant. However, the results at the third hour indicated that the 450-calorie, high-carbohydrate breakfast maintained the blood sugar at or above the fasting level better in the subjects weighing the least. Of the twelve heaviest subjects, three showed a 24 to 26 per cent fall in blood sugar below the fasting level at the second, third, or fourth hour after breakfast. In the lightest group, only one subject showed as great a drop in blood sugar.

High-Protein Breakfast. Figure 1, Graph C indicates that in the heaviest group, the highest average chylomicron count was reached shortly after the second hour; in the lightest group, it was reached at the third hour. As is indicated in Figure 2, Graph C, the blood sugar curve for the heaviest subjects showed only a slight rise at ½ hr. but remained above the fasting level through the second, third, and fourth hours. For the group weighing least, there was a peak in the curve at ½ hr. followed by a fall to the fasting level at 2 hr. Then, there was a very slight rise through the third and fourth hours. Of the twelve heaviest subjects, only three showed as much as a 10 to 12 per cent fall in blood sugar below the fasting level at the second, third, or fourth hour. In the group weighing least, one subject showed a drop of 13 per cent in blood sugar at the second hour and another a 10 per cent drop at the third hour.

High-Fat Breakfast. Following the high-fat breakfast, the average chylomicron counts increased and decreased more rapidly in the heaviest group (Figure 1, Graph D). In both groups, the highest counts were obtained at the third hour. Figure 2, Graph D shows that there was not much difference in the average blood sugar values for the two groups. The lowest average value for the heaviest subjects was reached at the second hour and for the lightest group at the third hour. In neither group did the averages fall as far below the fasting level as they did for the heaviest subjects following the high-carbohydrate breakfast.

8 Heaviest Subjects vs. 8 Lightest

The results obtained for the eight heaviest subjects were compared with those for the eight lightest, to determine whether greater group differences would appear in this comparison than were shown by comparing the twelve heaviest subjects with the twelve lightest. The eight heaviest subjects weighed from 147.3 to 193.5 lb. and were from 9.5 to 39.6 per cent overweight (11). The eight lightest ranged from 114.8 to 129.0 lb. and were from −9.4 per cent below to 9.2 per cent above the standards (11).

High-Carbohydrate Breakfast. The response of the eight heaviest subjects to the high-carbohydrate breakfast was similar to that of the twelve heaviest. Also the response of the group of eight lightest subjects was similar to that of the twelve lightest. Therefore, it may again be said that the high-carbohydrate breakfast maintained the blood sugar of the lightest subjects above or very near the fasting level but not that of the heaviest subjects.

High-Protein Breakfast. The responses of the smaller, selected groups of eight were similar to those of the analogous groups of twelve. Again, the high-protein breakfast maintained the average blood sugar of the heaviest subjects above the fasting level even slightly better than it did the lightest subjects.

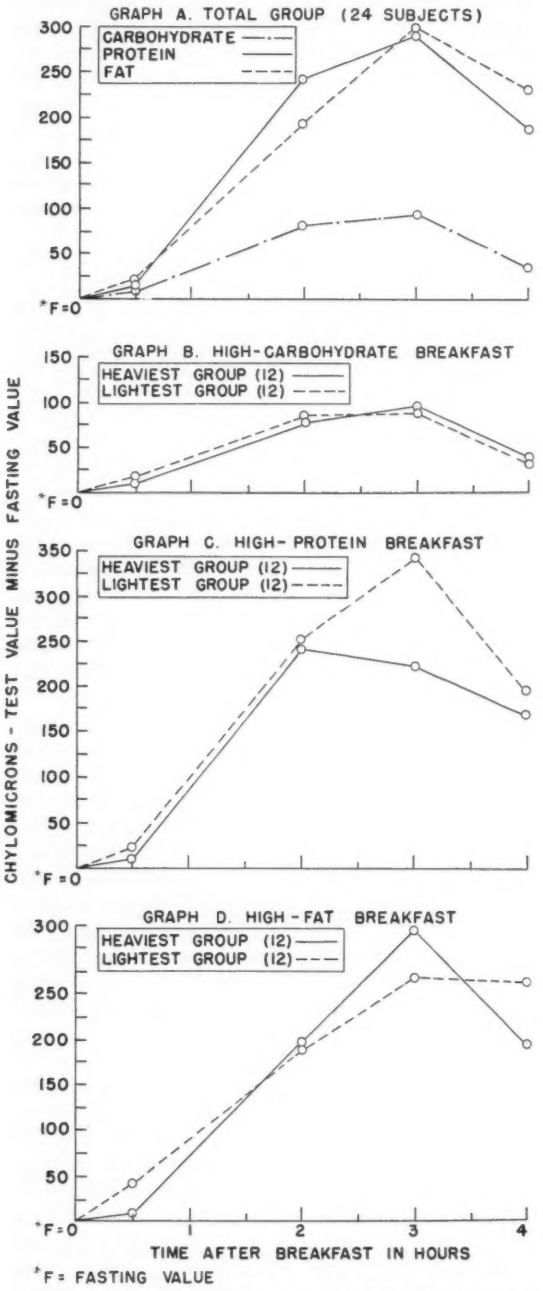

FIG. 1. *Average chylomycron counts following isocaloric high-carbohydrate, high-protein, and high-fat breakfasts.*

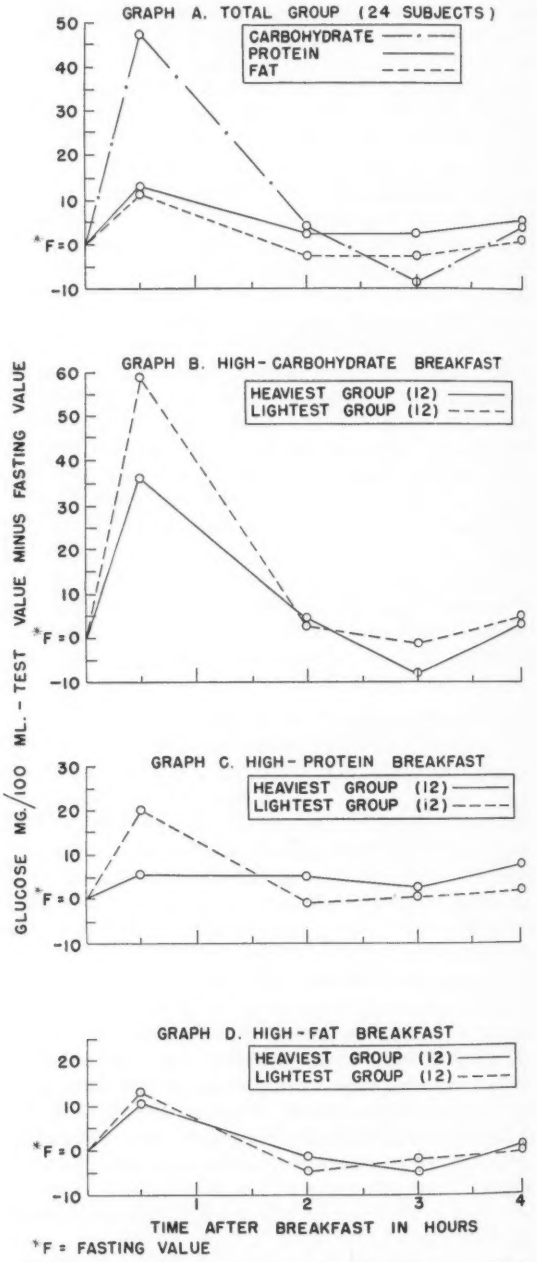

FIG. 2. *Average blood sugar values following isocaloric high-carbohydrate, high-protein, and high-fat breakfasts.*

High-Fat Breakfast. The average chylomicron count at the third hour was slightly higher for the eight heaviest subjects than for the group of twelve heaviest, but the curves for the two lightest groups were similar. Average blood sugar values were similar for the groups of eight and twelve heaviest and for the two groups of subjects weighing the least.

Breakfasts Usually Eaten by Subjects

In Table 3 is given a summary of the nutritive value of the breakfasts eaten by the subjects, according to group, during the week when they kept dietary records. The average breakfast for the subjects weighing the most contained 493 calories, 16.2 gm. protein, 19.8 gm. fat (36.1 per cent of the total calories) and 65.8 gm. carbohydrate, while the average for the lightest subjects contained 421 calories, 13.3 gm. protein, 19.1 gm. fat (40.9 per cent of the total calories), and 51.7 gm. carbohydrate.

DISCUSSION

The results of this study indicate that chylomicron counts and blood glucose determinations may be used to good advantage in the study of the ability of different types of meals to prevent hunger symptoms for a period of 3 to 4 hr. It has been shown (*Fig. 1, Graph A*) that the average chylomicron counts on the high-protein and high-fat breakfasts were almost the same at the third hour. This would suggest that, in subjects similar to ours, the effect of fat in delaying the rate at which the meal leaves the stomach could be obtained almost as well from a breakfast containing approximately 20 gm. fat[4] as from one containing approximately 30 gm. However, the protein content of the meal would have to be adequate to maintain the blood sugar above the fasting level. The low average chylomicron count (*Fig. 1, Graph B*) and low average blood sugar value (*Fig. 2, Graph B*) obtained at the third hour following the high-carbohydrate breakfast indicate that approximately 10 gm. fat in the meal has little effect in helping to maintain the blood sugar level. The 450-calorie, high-protein breakfast containing 23.2 gm. protein, 19.5 gm. fat (38.9 per cent of the total calories), and 45.8 gm. carbohydrate prevented severe hunger symptoms in all subjects. It, therefore, appears that the proportion of protein, fat, and carbohydrate used in this meal provided a food mixture which left the stomach at a slow enough rate to prevent hunger contractions due to an empty stomach and also maintained the blood sugar at or above the fasting level for at least 4 hr.

This breakfast contains more protein than was ordinarily eaten by the subjects. The average breakfast of the twelve heaviest subjects contained 16.2 gm. protein which, according to Addison *et al.* (7), would be about the minimum needed to maintain the blood sugar at or above the fasting level for 3½ hr. The average breakfast of the twelve subjects weighing the least contained only 13.3 gm. protein, which is below the minimum. Both groups were receiving a moderate amount of fat (approximately 20 gm.) in their breakfasts. This amount of fat would delay the emptying of the stomach and help to keep the blood sugar from falling to a very low level. However, an increased amount of protein in the breakfasts would have the advantage of maintaining the blood sugar above the fasting level.

Effect of Fat in Reducing Diets

In their studies of weight reduction in college women, Young *et al.* (9, 10) used a 1400-calorie diet containing 90 gm. protein, 80 gm. carbohydrate, and 80 gm. fat (50 per cent of the total calories). While this diet was quite satisfactory for preventing hunger and fatigue during weight reduction, their subjects showed increased values for total lipid, phospholipid, and total cholesterol in the fasting blood serum (10). In the majority, these values increased to a limited degree in the post-reducing maintenance period. The increase in the fasting blood lipids in their subjects may possibly have been due to a disturbance in the metabolism of fats caused by the relatively low proportion of carbohydrate which was being metabolized. As stated by Cantarow and Schepartz (4 [p. 483]), "an intimate quantitative relationship exists between the metabolism of fatty acids and of carbohydrate. When the rate of oxidation of carbohydrate, the preferred fuel of the body, falters, fat is mobilized from the depots to the liver. . . The rate of degradation of fatty acids in the liver is then increased." However, with the accompanying decrease in the oxidation of carbohydrate, there is a shortage of oxalacetic acid and an increase in keto-

[4] The amount contained in the high-protein test breakfast was 19.5 gm.; in the high-fat breakfast, 30.9 gm.; and in the high-carbohydrate breakfast, 11.1 gm.

TABLE 3

Composition of average breakfasts ordinarily eaten by subjects

GROUP	CALORIES	PROTEIN		FAT		CARBOHYDRATE		CALCIUM	PHOSPHORUS	IRON	VITAMIN A	THIAMINE	NIACIN	RIBOFLAVIN	ASCORBIC ACID
		Intake	Per cent of total calories	Intake	Per cent of total calories	Intake	Per cent of total calories								
		gm.		*gm.*		*gm.*		*mg.*	*mg.*	*mg.*	*I.U.*	*mg.*	*mg.*	*mg.*	*mg.*
11 heaviest subjects*	493	16.2	13.2	19.8	36.1	65.8	53.4	343	376	3.9	923	0.30	2.0	0.56	33
12 lightest subjects	421	13.3	12.7	19.1	40.9	51.7	49.2	262	291	2.2	947	0.25	1.4	0.46	35

* One subject who did not eat breakfast omitted.

genesis. The increased mobilization of body lipids is reflected in the loss of body fat and also in an increase in blood plasma lipids, including cholesterol (4 [p. 483]).

Since recent findings have indicated a relationship between high-fat diets and atherosclerosis (22), it would appear that reducing diets containing as much as 50 per cent of the total calories in the form of fat might be objectionable, especially if used over a long time. However, due to the delaying effect of fat on the emptying of the stomach, meals containing a moderate proportion of fat (30 to 40 per cent of the total calories), a high proportion of protein, and a low proportion of carbohydrate should be satisfactory for preventing hunger symptoms.

SUMMARY

Isocaloric breakfasts high in carbohydrate, protein, or fat were eaten by twenty-four young women ranging in age from seventeen to twenty-nine years and weighing from 114.8 to 193.5 lb. Finger-blood samples were taken before breakfast and 30 min., 2 hr., 3 hr., and 4 hr. after breakfast. Chylomicron counts and glucose determinations were made on each serum sample. In connection with the breakfast tests, the subjects kept records of the foods which they ordinarily ate for breakfast for one week. The results indicated the following:

For the whole group of twenty-four subjects, the highest average chylomicron counts came at the third hour following the high-fat and high-protein breakfasts. Following the high-protein breakfast, the average blood sugar values remained above the fasting level through the fourth hour. After the high-fat and high-carbohydrate breakfasts, the average values fell below the fasting level at the second and third hours. The greatest average drop in blood sugar occurred at the third hour following the high-carbohydrate breakfast.

When the group was divided into the twelve subjects weighing the most and the twelve weighing the least, the results differed somewhat. For the heaviest subjects only, the average blood sugar value fell below the fasting level at the third hour following the high-carbohydrate breakfast. The average values did not fall below fasting for either group following the high-protein breakfast. Following the high-fat breakfast, the average values fell below fasting at the second or third hour but did not fall as low as for the heaviest group following the high-carbohydrate breakfast.

The breakfasts ordinarily eaten by the twelve heaviest subjects contained more calories and protein than those eaten by the twelve subjects weighing the least.

The amounts of protein, fat, and carbohydrate used in the high-protein breakfast were satisfactory for preventing hunger symptoms in nearly all of the twenty-four subjects, irrespective of body weight.

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Factors Affecting Calcium Absorption by Adults[1]

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THE literature was reviewed to find the calcium balance studies carried out on human adults and to derive from them the factors which affect the absorption of calcium. This review differs from most previous reviews of calcium metabolism in that it deals with the amount "absorbed" rather than the amount "retained." The difference is simply that to find values for the amount of calcium "retained," the calcium in the urine and the feces are subtracted from the intake; while, to find the amount "absorbed," only the calcium in the feces is subtracted. For the latter value a correction might be, but has not been, made in this review for the endogenous calcium in the feces. The omission of this correction is justifiable because the values are used only for comparing the amount absorbed under different conditions and not as true absorption values in themselves. Only those studies are included in which the experimental periods were of acceptable length as defined by the authors (1).

PHYTATES

Phytic acid, a phosphorus-containing compound found mainly in whole cereals but also present in a few other foods, combines with calcium to form an insoluble compound and may therefore interfere with the absorption of calcium. Three groups of workers—Burton (2), McCance and Widdowson (3, 4), and Cullumbine *et al.* (5)—found that whole cereals reduced calcium absorption, but Nicolaysen and Njaa (6) did not find a similar effect.

An explanation of the difference in results has been offered by Krebs and Mellanby (7) (Table 1), who found that the amount of calcium in a diet was a determining factor in the effect of phytate on calcium absorption. When the intake of calcium was generous, the amount of calcium absorbed was not affected by 1 lb. bread made from flour of 85 per cent extraction or relatively high phytic acid content; when the intake of calcium was low, the amount of calcium absorbed was reduced by the inclusion in the diet of 1.7 lb. of the aforementioned bread. Contrary to this, McCance and Widdowson (Table 1) found interference at both low and high intakes of calcium. This may be explained by the fact that the total phytic acid content of the bread used by the latter workers was greater. They not only used a large quantity of dark bread but also added chemical compounds to prevent hydrolysis of phytic acid during the fermentation period.

The finding of Krebs and Mellanby noted above was later substantiated by two other studies in which oatmeal furnished the phytic acid. Cruickshank *et al.* (8) included oatmeal in diets containing three levels of calcium and found a smaller percentage of calcium absorbed at the low intake than at the moderate and high ones. The other study (9, 10), which included radioactive calcium in addition to oatmeal, was made on boys. The authors concluded that "the effect of phytates in oatmeal in meals containing moderate quantities of calcium is masked and of no practical importance."

Whether phytic acid interferes with the absorption of calcium apparently depends on the amount of both phytic acid and calcium in the diet. In all probability, if a diet for adults contains the recommended amount of calcium, a moderate amount of whole cereal will not have a harmful effect on calcium absorption.

The suggestion has been made that people who habitually eat whole cereals adjust to their use and soon absorb as much calcium as if phytic acid were not present. This may be the case, but as yet there is not sufficient evidence to warrant this conclusion for adults. Subjects studied by McCance and Widdowson over a period of three to four weeks showed no tendency to adapt in that length of time. Walker *et al.* (11) placed subjects on a diet containing bread made from dark flour. One subject whose usual

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TABLE 1

Studies concerning the effect of wheat bread of high extraction on calcium absorption

INVESTIGATOR	PER CENT EXTRACTION OF DARK FLOUR	DARK BREAD INTAKE		CALCIUM INTAKE		CALCIUM ABSORBED*	
		Weight	Phytic acid phosphorus	White bread diet	Dark bread diet	White bread diet	Dark bread diet
		gm./day	*mg./100 gm.*	*mg./day*	*mg./day*	%	%
McCance and Widdowson (3)	92	530	100	495	560	32.7	11.6
				1149	1248	22.4	14.0
McCance and Widdowson (4)	92	530	100	498	562	38.2	6.5
Krebs and Mellanby (7)	85	766‡	41.4	552	550	44.2	28.3
	85	456†	41.4		941		—
Walker *et al.* (11)	95	454	50	479–890	485–761	37.5	28.6
Nicolaysen and Njaa (6)	95	286–434	100–140	845	795	27.2	23.0

* Not corrected for endogenous calcium in the feces. Corrected values would be higher.

† No values were given for the calcium content of the feces and therefore the percentage absorbed could not be calculated. The subjects were in balance at this higher intake. On the lower calcium intake, which was below their customary one, five of the six subjects were in negative balance on both white and dark bread.

‡ In addition to this 80 gm. flour was eaten in cooked dishes.

diet contained about the same amount of calcium as the experimental one showed no signs during a four-week period of adjustment in the amount of calcium absorbed. Three other subjects contributed little to the solution of the problem because they were given diets containing less than half the amount of calcium contained in their "usual" diets and might therefore have been adjusting to the dietary intake rather than to phytic acid.

OXALATES

Some natural foods, such as spinach, Swiss chard, beet greens, rhubarb, and cocoa, contain appreciable amounts of soluble oxalates and oxalic acid. When oxalic acid reacts with calcium, calcium oxalate, an insoluble compound, is formed which may interfere with the absorption of calcium. McLaughlin (12) found that the calcium in milk was absorbed better than the calcium in spinach although the amount retained was about the same. Later Fincke and Garrison (13) found that more calcium was absorbed from a diet including kale which contains only a trace of oxalic acid than from one including spinach. Recently Johnston *et al.* (14) reported that when a large serving of spinach was added to the diet of young women in a meal which did not contain milk, the fecal content of calcium rose only to an amount equivalent to that in the spinach. From these three studies and one on children (15), the following conclusion can be drawn: spinach cannot be considered as a source of calcium but is not detrimental to the absorption of calcium from other foods in the same meal.

Cocoa (16), too, probably largely because of its oxalic acid content, interferes with the absorption of calcium (but not its retention).

CALORIC RESTRICTION

Nutritionists have begun to make metabolic studies of subjects living on reducing diets in order to detect metabolic changes which may occur. Since 1946, three groups of workers have included calcium balance experiments in their studies.

Leverton and Gram (17) found that the percentage of calcium absorbed by eighteen women on a reducing diet fell from 20 (uncorrected for endogenous calcium) during the second nine days of an eighteen-day period to 12 and then 15 in the two succeeding periods.

In two studies by Young *et al.* (18, 19)[3], the amount of calcium absorbed by eighteen college girls decreased progressively during a reducing period, and by the seventh or eighth week in one study and the ninth or tenth week in the other, none was being absorbed. In the more recent of the two studies, a balance experiment made during the fourth week after the termination of the reducing diet showed that the subjects were still losing more calcium than at the beginning of the reducing period.

Brown *et al.* (20) reported that the mean percentage (uncorrected) of calcium absorbed by eight subjects fell from 30 to 22 and then to 20 in pre-reducing, reducing, and post-reducing periods, respectively. Brewer *et al.* (21) found subjects on a reducing diet were in negative calcium balance by the third week. Probably the amount absorbed was decreased also, although values for absorption were not reported.

From the above evidence, it appears that caloric restriction has a detrimental effect on the absorption of calcium.

PROTEIN

A generous protein intake has been found in recent years to be advantageous. One reason is that it promotes the absorption of calcium. Kunerth and Pittman (22), Pittman and Kunerth (23), and Hegsted *et al.* (24) have noted an increase in the amount of calcium absorbed by adults when the protein content of the diet was increased from low

[3] Fecal values were supplied by the authors.

to moderate levels. McCance *et al.* (25) noted an increase when the protein content of the diet was increased from a moderate to a high level.

CALCIUM INTAKE

When the calcium intake is increased, the percentage of it which is absorbed decreases. This fact is well established. From a compilation of studies in the literature, Brine and Johnston (1) found that at an intake of 400 to 599 mg. calcium per day, 43 per cent (corrected for endogenous calcium) was absorbed. The percentage fell with increasing intake until, at an intake of 1000 to 1199 mg., only 28 per cent was absorbed.

The theory that the previous intake affects the amount of calcium absorbed was proposed some time ago, and attention has been focused on it again in recent years. According to this theory people who have been living on high intakes and are then placed on lower ones absorb little or even no calcium at first but as time goes on absorb more. If they are studied before they have adapted to the lower level, a false impression is obtained of the amount they will require in the long run to cover their losses.

The authors have been unable to find sufficient evidence in the balance studies which have been published to prove that an adjustment in the absorption of calcium takes place. Some authors have mistakenly interpreted the temporary change in the fecal content of calcium following a change of intake as a temporary change in the percentage absorbed. It is due to a lag in excretion which extends beyond the fecal marker and lasts from two to five days, depending on the magnitude of the change and the individual. It must be pointed out that if adaptation takes place only after a long interval of time, the literature contains little that can be used as evidence because subjects have seldom been maintained for more than one month at a given intake level. In fact only one study (14) was found in which a constant intake was maintained for more than a month.

A balance study which supplies positive evidence is that of Hegsted *et al.* (24)[4]. They studied prisoners in Peru who had been living on a low calcium intake for a long enough time to have adapted to it, if adaptation takes place. They found a high percentage of calcium was absorbed. To validly conclude, however, that the Peruvian prisoners were absorbing unusually well, subjects with better dietary customs would have to be studied at the same time.

Nicolaysen *et al.* (26), in a review article, cite unpublished work done in their laboratory on fourteen prisoners for periods of several months. They state that when the subjects were changed from one intake to a lower one, "the characteristic feature of all persons observed for sufficient time to allow of a precise evaluation was that the fecal calcium decreased progressively."

Attention should be called to the fact that subjects can adjust to a changed level of calcium intake by making adjustments in the urinary loss of calcium and in the excretion of endogenous calcium in the feces as well as by changes in the amount absorbed.

VITAMIN D

Vitamin D functions in part by increasing the amount of calcium absorbed. The addition of the vitamin increased the calcium absorption by only a few of the subjects taking part in balance experiments. The results of the balances have been interpreted as meaning that, when an individual is obtaining enough of the vitamin, the addition of more is of no value.

PHOSPHORUS

The possibility has been suggested that when phosphorus is added to a diet some of the dietary calcium may combine with it and form an insoluble salt which is poorly absorbed. In 1951 Leichsenring *et al.* (27) reported than an increased phosphorus intake decreased the amount of calcium absorbed. Two years later (1953), another study (28) was reported from the same laboratories in which, at each of three levels of calcium intake, an increase of phosphorus intake was without significant effect on calcium retention. Absorption could not be calculated because fecal values were not reported.

In the same year (1953), Malm (29) reported studies made on men. He employed two control periods, one before and one after the addition of phosphorus. He and his associates had noted in long-term experiments that the amount of calcium in the feces of a given subject on a constant calcium intake often fluctuated in a wave-like fashion. The second control period allowed him to judge whether the variations in fecal excretion of a subject were due to normal fluctuations or to the experimental variable. This is a valuable technique, particularly where only a few subjects can be studied. Malm noted no effect on the fecal excretion of four men when 250 mg. phosphorus was added as orthophosphoric acid nor in two men when 600 mg. phosphorus as neutral sodium or potassium phosphate was added.

The results of these and a limited number of studies on single individuals or those suffering from some pathologic state lead to the conclusion that an increase in the phosphorus content of a diet probably does not inhibit the calcium absorption.

FAT

Several groups of workers have investigated the effect of fats on the calcium absorption, but only the recent work will be considered here because in it

[4] Fecal values were supplied by the authors.

larger numbers of subjects and longer experimental periods have been used. When Steggerda and Mitchell (30) increased the fat content of a low-calcium diet by the addition of homogenized milk and butter, calcium absorption by the subjects was not affected. Fuqua and Patton (31) fed a diet of moderate calcium content with a fat intake of three levels and from both animal and vegetable sources. The calcium absorption could not be calculated from the data reported. The amount was probably not affected because the balance was not changed. Meyer *et al.* (32) found the same amount of calcium was absorbed by their subjects from a low-fat diet as from one of moderate fat content. These three experiments lead to the conclusion that, for adults, the level of fat intake has no effect on calcium absorption, even when the calcium intake is low.

AGE

Whether the calcium requirement of human adults increases as people grow old and whether, if that is the case, the cause is a decrease in the percentage of calcium absorbed is a question.

Calcium absorption by fifty-six men and women sixty years of age and over (Table 2) who took part in five studies was compared to the amount absorbed by a larger group of adults of all ages at corresponding levels of calcium intake. The latter values were taken from a compilation by the authors (1) of this paper. Men investigated by Bogdonoff *et al.* (33) and women studied by Ohlson *et al.* (34) absorbed about the same amount as subjects of all ages; men investigated by Owen (35) absorbed more; and elderly men and women studied by Ackermann and Toro (36, 37) absorbed less than adults of all ages. The poor absorption of the last group may have been due to the fact that the subjects were older than those in the other groups of people sixty years of age and older or because they had been living on poor diets. They belonged to the lower economic strata. This comparison yields little information regarding the effect of age.

TABLE 2

Percentage of calcium absorbed by subjects sixty years of age and over and by comparable subjects below that age

AUTHOR	PLACE WHERE SUBJECTS LIVED	NUMBER OF SUBJECTS	AGE RANGE	CALCIUM	
				Mean intake	Mean absorption*
			yr.	*mg./day*	*%*
Owen (35)	own	4	65–70	524	30
	homes†	6	32–53	524	38
		4	65–70	879	33
		6	32–53	879	48
Bogdonoff *et al.* (33)	city hospital‡	3	66–81	859	20
Ohlson *et al.* (34)	own homes	37	60–89	774	16
		98	30–59	864	20
Ackermann and Toro (36)	city hospital‡	5	70–87	843	2
Ackermann and Toro (37)	chronic hospital‖	7	68–83	954	11

* No correction was made for endogenous calcium in the feces. Corrected values would be higher.

† Out-patients at a clinic for obesity and diabetes, but bed patients during the experimental period.

‡ The subjects were ambulatory.

‖ The values for a woman 48 years of age have been omitted.

Since two (Table 2) of the five studies included people below and above sixty years old, a comparison of calcium absorption by the two age-groups under the same experimental conditions could be made. Ohlson *et al.* found that the individuals in the older group absorbed less calcium than those in a younger group. The difference was small, however, and probably not statistically significant (a calculation of the significance could not be made because sufficient data were not available). The percentage of calcium absorbed by persons in each decade of age was 16.7, 18.8, 22.3, 14.8, and 18.9, respectively from the third through the seventh decade. This gives no indication of a gradual decrease in the ability to absorb with advancing years. If the differences between the sixth decade and those above and below it are statistically significant, one might wonder whether something commonly occurs in the sixth decade which causes poor absorption. This might be a factor related to age but not age *per se*.

A second study which included subjects below and above sixty years of age is Owen's. The amount of calcium absorbed by the two groups was not significantly different when the intake was similar to their customary one but was significant at a higher intake. This may indicate that as people grow older they do not adjust quickly to changes in dietary intake of calcium.

The conclusion reached after reviewing the five studies is that sufficient evidence is not yet available to prove a decrease in calcium absorption in the later years of life. Possibly age has an effect which is obscured by other factors. The possibility is suggested by experiments on animals (38–40) in which a reduction in the amount of calcium absorbed in old age has been observed. On the other hand, possibly the apparent decrease in absorption was due in part to an increase in the endogenous calcium in the feces. Hansard *et al.* (40) found an increase in endogenous fecal calcium in old age in the case of cattle.

ACTIVITY

In 1948, Deitrick, Whedon, and Shorr (41) reported a study made on four young men. During a six- or seven-week immobilization period, "the increase in fecal calcium excretion was variable but generally progressive, fecal calcium being greatest during the latter weeks of bed rest." During a recovery period, the fecal calcium decreased slowly

and continued for three weeks to exceed pre-experimental levels. The results of this study and another made on children (42) lead to the conclusion that immobilization probably interferes with the absorption of calcium.

ENDOCRINES

Because this review is concerned with normal people, the effect of abnormal levels of endocrine secretion have not been reviewed except in the case of excessive thyroid excretion which is well known to have a deleterious effect on the amount of calcium absorbed as well as increasing urinary loss.

SUMMARY

Among the factors which have been reviewed, only protein and vitamin D improve calcium absorption. The vitamin causes improvement only when administered to people with an inadequate supply.

Several factors reduce the amount of calcium absorbed from the diet. Phytates have this action if the diet is high in phytates and low in calcium. Oxalates interfere with absorption but only to a minor extent. When people live on an inadequate caloric intake and also when they are immobilized, they absorb less calcium. While they absorb more total calcium at high intakes than at low ones, the percentage is lower.

Two factors which have sometimes been considered as important have been found to have no effect. These are the amount of phosphate and of fat in the diet.

The evidence is still inclusive regarding the effect of age and the previous intake of calcium.

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Brucellosis

Brucellosis, also known as "undulant fever" or "Malta fever" in human beings and as "contagious abortion" or "Bang's disease" in cattle, is one of the biggest remaining threats to human health from farm animals. Although last year only 2.6 per cent of U.S. cattle were infected, there can be no peace or safety until every cow, pig, and goat in the U.S. is brucellosis-free.

How does brucellosis affect human beings? Fatigue, an up-and-down "undulant" fever, nagging backache, headache and insomnia, loss of appetite, anemia, depression, and general wasting away are the most frequent symptoms. To a doctor, this picture may suggest typhoid fever, tuberculosis, flu, or other infections. In the past, chronic brucellosis was thought to be, in some cases, a mental affectation rather than physical disease, for depression can be an outstanding symptom. Acute brucellosis is easier to diagnose, but the chronic form is so elusive that there are undoubtedly many more sufferers than the 2000 cases a year being reported. Less than 2 per cent of brucellosis patients die, but many are left with jaundice, arthritis, or gall bladder trouble, and there is some evidence that brucellosis can cause sterility in men.

Bacteria of the genus Brucellosis enter by the mouth, through wounds, pass through exposed mucous membranes, are breathed in or penetrate the unbroken skin, get into the blood stream and lodge in the various lymph nodes. There are three main microorganisms, any of which may be found in any animal and all can infect man.

Human beings get the disease from animals, almost never from other human beings. Eating infected milk and dairy products was once regarded as the main source of infection, but since widespread pasteurization, the bacteria are most likely to get into the human system through direct contact with the animals themselves. Young adult male farmhands are the most frequent victims, and about half the reported cases are in Iowa, Wisconsin, and Minnesota. Packing house workers may also contract the disease.

In spite of many suggested remedies, there is no satisfactory cure for domestic animals with proved brucellosis. Even those which appear to recover may infect other animals and man. The value of the wonder drugs in treating human brucellosis is still being studied. Some success has been achieved in Mexico with the use of Aureomycin and Achromycin tetracycline.

Brucellosis would disappear if every infected animal could be located and destroyed, but this cannot be accomplished overnight. Science has developed a vaccine to protect young cattle against infection, which will help to eradicate the disease. Also, a blood test has been discovered which identifies the disease in an animal.

With the use of these scientific techniques and a federal aid program of $15 million, farmers and local health authorities are now waging an intensive war against the disease in cattle.

Maternal and Infant Feeding Practices in a Peruvian Village[1]

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ESPINOS is a village in the valley of Ica on the south-central coastal plain of Peru. Its 230 residents speak Spanish, are of mixed Indian-Spanish ancestry, and follow a way of life which is neither Indian, Spanish, nor modern Latin American but a vigorous mixture of all three. They are industrious, dignified, and poor. The village enjoys perennial sunshine and no rain; water for irrigation farming is provided by seasonal run-offs from the adjacent ranges of the Andes. Espinos shares many features of culture and social organization with hundreds of communities along Peru's coastal plain, including the northern coastal villages of San Nicolás and Carquin, for which dietary surveys have been reported (1, 2).

Family plots produce a rich variety of fruits and vegetables. In addition, villagers raise some cash crops and occasionally hire out as field hands on nearby cotton plantations. Between the food that families grow and the little they are able to buy, adults get along on diets which, though unevaluated as to nutritional adequacy, cover a rather varied food supply.

However, in Espinos as in other rural communities of the Ica Valley mothers place arbitrary restraints on their diets during pregnancy and lactation. One effect of these restrictions is apparently to eliminate several sources of nutrients during critical stages of the child-bearing cycle. Moreover, mothers deliberately refrain from supplementing the milk diets of infants until late in the first year.

To be sure, Espinos mothers have had little formal schooling and are unversed in nutrition. Yet mothers rarely solicit nutrition information in their occasional contacts with professionals of the region's health department and are courteously unreceptive when unsolicited counsel is offered. Certainly, Espinos mothers are poor. Yet within the limits of their economic resources, mothers possess—and refuse to utilize—means of improving their own and infants' diets.

The village well in Espinos

Present data, obtained in the course of first-hand field study of Espinos and its way of life, were gathered by the author, a cultural anthropologist, and his assistant, Abel Muchaypiña, a resident of the region. About four months during 1952–1953 were devoted to the study. Research methods involved interview and observation, both of which were conducted informally and in the course of frequent contact with villagers. Data were obtained from nine mothers, some of whom were interviewed four or more times. The infant feeding practices of many of the community's child-bearing mothers were repeatedly observed.

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Family group in Espinos

On the grounds that knowledge useful to the region's health department might be gained from an examination of cultural factors involved in maternal-infant feeding in Espinos, the author sought answers, among others, to two questions: What are the dietary practices associated with early infancy, pregnancy, and lactation? What are the beliefs and convictions—the cultural standards—that underlie them?

CUSTOMARY PRACTICES

Five sets of practices constitute the dietary patterns associated with early infancy, pregnancy, and lactation in Espinos.

(a) For his first three days of life, the infant is not fed. Instead, from time to time, the mother coaxes him to suck at bits of cotton, dipped in a mild laxative oil. She continues the use of oil-dampened cotton for some days after he has begun to suckle.

(b) During this period, the mother squeezes the colostrum from her breasts and discards it. She also takes a laxative.

(c) Following the third day, the mother suckles the infant whenever he cries. For some days, however, she attempts to underfeed at each nursing, permitting unrestricted suckling only after a week or more.

(d) During early infancy, indeed until some time between the sixth and twelfth month, the child receives only milk except for herb tea or sugared water on occasion. Though a variety of fruits and vegetables are available, they do not form part of the infant's diet. Though there is daily sunshine, infants are rarely exposed to direct sunlight before the sixth month. Milk for bottle-fed babies is always boiled.

(e) During both pregnancy and lactation, the mother consumes less meat, eggs, and fresh fruit and vegetables than she ordinarily eats. Her consumption of milk remains at its perennially low level. The bulk of her diet comes from corn, beans, squash, rice, and various teas, soups, and stews.

Tentative evaluation of the dietary reveals that calcium intake of Espinos mothers, never high, remains low before and after childbirth. In addition, the mother's intake during the entire child-bearing cycle appears to be low in protein, ascorbic acid, and the B vitamins. Relative to the child's intake, the mother's breast milk may reflect lacks in the maternal diet. Presumably, the evaluations of infant intakes in San Nicolás and Carquin (1) would serve as reasonable approximations for Espinos.

Dietary evaluations are from the perspective of outside observers, who bring to bear outside standards. From the viewpoint of Espinos mothers, however, prevailing dietary customs have been evaluated by Espinos standards. Let us examine the practices point by point, centering our attention on the cultural standards that underlie and influence them.

RATIONALE OF PRACTICES

Use of Oil-Dampened Cotton

Instead of feeding the newborn for the first three days, the mother urges him to suck on bits of cotton dipped in a mild laxative oil—usually almond oil. This practice has a triple rationale for mothers.

First, the meconium, or typical fecal excretion of the newborn, is perceived by the mother as evidence that the child is born with a "dirty stomach." She trusts that the laxative will facilitate the expulsion of the meconium and the cleaning of the stomach. The mother fears that sickness or even death might result were the infant to ingest milk on a meconium-fouled stomach. The concern with the stomach and its state of dirtiness —one that will plague the villager through life—thus takes priority at birth.

Second, the mother believes that the infant's equipment for sucking and swallowing is functionally rudimentary and needs to be stimulated into efficient activity. The sucking of oiled cotton is perceived as a necessary trial run for the sucking reflex. The idea relates to the local concept that the newborn is still essentially embryonic, a creature not yet wholly formed, requiring maternal aid to perfect his physical formation. In line with this, the mother does more than prod his sucking reflex to work. She also molds his head-form, tries to expedite the closing of the fontanel, worries that his stomach may float free in abdominal space if not firmly moored with a belly band, and by swaddling and massage assists his limbs to grow straight.

Both of the foregoing are part of local conceptions of the body, or "body images." The third has to do both with a body image and with conceptions of food. The mother regards milk as drink "too strong" for the frail stomach of the newborn and defines the three-day laxative oil regimen as one of gradual preparation for the assumed shock of milk. Were he to suckle on his first day, it would be—in one mother's graphic phrase—"like a dash of milk on a feeble flame."

Elimination of the Colostrum

The colostrum in Espinos thought is a waste, quite on the same level of discourse as the infant's meconium and the mother's waste-products of menstrual and child-bearing cycles. In the mother, it is believed to block the milk-flow; vis-a-vis the child, it is feared capable of fouling the stomach and of wreaking even fatal harm. In consequence, the mother busies herself in carefully squeezing the colostrum from her breasts and in disposing of it—as with the wastes of menstruation and after-birth—by burial.

Also during the first three days, the mother takes a laxative, one intermediate in potency between the mild oil sucked by infants and the concoctions consumed by adult males. Powdered milk of magnesia is a favorite. By Espinos definition, the mother has a dirty stomach since, in obedience to custom, she has not taken a laxative during the months of pregnancy. Now, obeying custom, she must clean her stomach in preparation for nursing. The laxative is believed to promote a desirable chain-reaction of unblocking effects, resulting in more buoyant circulation of blood, generally improved body tone, facilitated elimination of the colostrum, and an ample flow of milk.

Breast-Feeding Pattern

Following the third day, the mother nurses the infant when he cries. She tries to withdraw him from the breast before he is satiated, however, permitting him to suckle without restriction only after several days to a week.

Village mothers go about the business of infant care with assurance and calmness. All feed at the baby's demand. A crying babe is perceived to be either uncomfortable, hungry, or ill—in approximately that order—and is seldom permitted to cry for more than a few minutes before being attended. If the mother cannot identify any obvious source of discomfort and cannot quiet him with the breast, she presumes that he is ill.

The mother's efforts to limit amounts suckled for the first days of nursing are part of the pervasive emphasis on the gradual initiation of the child to a new and different dietary pattern. Hence, the restricted nursing of the early days is supposed to bridge the change from oil to milk.

Diet of Early Infancy

During early infancy, until sometime between the sixth and twelfth month, the child subsists wholly on milk except for occasional servings of herb tea or water. Though oranges and a variety of fruits and vegetables are economically and physically available, they are not included in the infant's diet. The reasons for delayed supplementation of infant diets, as for other aspects of infant feeding, involve local conceptions of the body and of food.

The infant organism is conceived to be delicate, to "lack resistance;" and solid foods, even semi-solid paps, are feared to be "too strong" for the assumed frailty of the stomach and organism. The prime need of the first months is assumed to be that of gradually building up the infant's resistance so as to enable him later to withstand the ingestion of solid foods. This build-up is felt to be accomplished through an unsupplemented milk diet. Cultural emphasis is on both the *unsupplemented* and the *milk*.

Certain ideas about milk and its relation to other foods and the body are also implicated. Though milk is regarded as the only appropriate food for infants, its use is ringed with precautions. By itself, it is felt to be a "good" food; when consumed in combination with many other items, it is regarded as a potentially harmful one. Specifically, drunk before or after nearly all fruits, sweets, "heavy" foods or "cold" ones, milk is believed to produce antagonistic internal mixtures and "bilious" reactions. The infant stomach is said to be ill-equipped to tolerate either the hostile mixtures or the accompanying bilious attacks.

What Espinos defines as a sort of supplemental feeding does occur before the sixth month, sometimes as early as the first: the bottle is deliberately substituted from time to time for the breast. This practice answers a number of felt needs. It permits the breast-feeding mother occasional freedom of movement, and it allows her to withhold the breast when she is ill or has violated a food prohibition. Perhaps most importantly, however, it is also designed to accustom the child to the bottle well before he is to be taken from the breast, i.e., it is of a piece with the pervasive pattern of gradual initiation.

The few mothers who are unable to breast-feed use nursing bottles. The latter are soft drink bottles capped with cheap rubber nipples. The milk comes from cow, goat, or commercial condensed products. Wet nurses are resorted to only rarely. Bottles are prepared one at a time as needed, and the milk is *always* boiled. In the case of condensed milk, the water alone is boiled and is then mixed with the milk. Mothers have thus far not accepted dried milk being convinced that it is not real milk but an obvious chemical synthetic.

The reasons for boiling milk have nothing to do with sanitation and have everything to do with the local system of "hot" and "cold" distinctions in foods. Unboiled milk is "cold" and therefore dangerous for the infant; its coldness and danger are believed to be neutralized through boiling.

Infants are rarely and minimally exposed to the sun. For one thing, mothers say that their constitutions must acquire the resistance to withstand such exposure. For another compelling reason, exposing them to the sun often means likewise exposing them to being "eyed" by the stray (or deliberate) glance of an individual who might possess an evil eye. It is

Children of Espinos carrying water to their home

believed that the glances of such individuals, often unbeknownst to themselves, have the power to cause babies, young animals, and even plants to sicken, wither, and die. Finally, mothers are also afraid of exposing infants to the "airs," a fear which serves also to inhibit sunning. As a result of these varied anxieties, mothers keep infants indoors, away from the sun, eyes, and airs. When infants are carried for any distance outdoors, they are either swaddled or simply draped with a protective blanket or large cloth.

Diet of Pregnancy and Lactation

The Espinos mother is fully convinced that the quality of maternal diet during pregnancy and lactation is of profound influence on her health and on that of her unborn child or infant. Anomalous as it may appear at first glance, it is precisely her adherence to this principle that leads her, during both phases of child-bearing, to reduce her intake of meat, eggs, and fresh fruit and vegetables and to consume no more than her ordinary low level of milk. The bulk of her diet is selected, more by a process of elimination than by positive choice, from corn, beans, squash, rice, tea, and varied soups and stews.

Village culture has provided the mother with certain bedrock convictions about food. She believes that some foods are "hot," some "cold," and that others are in an intermediate hot-cold range. These distinctions have little to do with actual temperatures but refer primarily to convictions as to the innate qualities of foods and their effects on the organism. She also distinguishes between "light" and "heavy" foods. Items with high-starch and low-water content are usually but not in all cases heavy. Also heavy are other foods believed to have perverse digestive qualities or stomach-fouling properties. In general, light foods are those which are simply "not heavy," as well as others believed to have indifferent nourishment value.

The dietary course is charted mainly by a multitude of "don't's." Most mothers obey the prohibitions willingly, while some chafe under the restraints. Obedience to custom, whether with good or bad grace, is due in large part to the mother's culturally inculcated conviction that disobedience is certain to unbalance her and the infant's health; it is also reinforced by the many informal pressures exercised by village public opinion through local lay-midwives, grandmothers, and other older female relatives.

The "don't's" are part of the culture's preventive medicine for individuals in a "delicate state," a condition perceived as intermediate to states of normal health and true illness, and a category that includes pregnant and lactating mothers. Based on the distinctions of hot and cold, light and heavy, the "don't's" resolve into three groups of restrictions: to avoid extremely "hot" foods, to avoid some and be prudent with all "cold" items, and to exercise appropriate avoidance and moderation with "heavy" foods.

The prohibition on extremely hot items—chocolate, alcohol in any form, and most condiments—has several preventive aims. Hot foods are said to aggravate the heartburn that goes with pregnancy. Also, their innate heat is believed capable of activating the uterus and inducing premature birth or abortion. During lactation, consumption of hot foods by the mother transmits a hot quality to breast-milk, which then becomes too great a stimulant for the infant. The few foods regarded as positively beneficial during both pregnancy and lactation are those defined as mildly hot: chicken broth, teas, and certain soups and stews.

As for cold foods, some are completely avoided, such as pork and watermelon. Others are consumed only infrequently in small quantities and only at mid-day: fish, leafy vegetables, and fruit. During the last several months of pregnancy and the first two or three of lactation, the latter foods are rarely touched. Cold foods—more accurately, their innate cold qualities—are profoundly feared. Cold is believed capable of lodging in the organism of mother, fetus, or infant and of wreaking harm even long after it has entered. It is supposed to act as a diffuse depressant and often figures in folk etiologies of pneumonia and tuberculosis. Besides being antagonistic to the mother's delicate state, cold is feared to be transmissible to the fetus via the placenta and to the infant through breast milk.

Some heavy foods—eggs and certain fruits—are completely avoided. Others—potatoes and other tubers and virtually all meat—are eaten only at mid-day, occur only in soups and stews, and are consumed in small quantities. Beans and corn, though heavy, are dietary staples and are eaten more frequently than the foregoing and in somewhat larger amounts. Heavy foods are defined as dangerous on three counts. One, they are conducive to a

dirty stomach, which is felt to be a major misfortune during pregnancy and a sluggish brake on the milk supply during lactation. Two, they may cause the mother to come to term with inordinately heavy weight gains, a condition which would distress the mother as much for its felt ugliness in her own and the community's eyes as for its believed distressing consequences at the time of labor. Finally, the mother prefers to give birth to a small rather than large baby. Besides preferring the relative ease of delivering a small baby, the mother is ashamed of a large newborn and feels it is offensively ugly.

One of the few consistent dietary "do's" of pregnancy is that the sudden food fancies of expectant mothers be humored. Women appear to gear their fancies to items that do not violate food restrictions. Common desires are for raisins, prunes, candies, and small pastries—all neutral in regard to dietary "don't's." A pervasive dietary "do" of lactation is that women drink tea regularly in the evening, in the belief that by morning it will have helped reproduce an ample supply of breast milk.

Vitamins and Orange Juice

Perhaps the only items of nutritional information that Espinos mothers talk about are vitamins and orange juice. They have heard of them in recent years through occasional contacts with health professionals—physicians, nurses, trained midwives —of the Ica Departmental Health Service, the regional dependency of Peru's Ministry of Public Health. They know of them also via nonprofessional recipients of the same information—city relatives and health program clients from nearby towns.

A few die-hards scoff at the existence of vitamins and do not "believe in" them. For most mothers, however, vitamins exist, are built-in constituents of some foods; these vitamins impart substance and vigor to the foods they inhabit. Few villagers are aware that vitamins are differentiated in any way or that synthetic vitamins exist.

Knowing little about vitamins, Espinos residents neither forget nor assimilate what little information they have about them; they re-define it. They regard vitamins as inappropriate for pregnant women and as even less suitable for babies. Vitamin-laden foods are too "strong" for infants; at the same time, they are too "fattening" for the pregnant. In essence, those edibles that enjoyed pre-vitamin reputations for their highly nourishing and/or fattening qualities have been endowed with vitamins. By and large, vitamins have been "added" to heavy foods. One woman explained that despite her fondness for beef and for fish-head soup, she had to forego them both during her pregnant state. She did so because, among other reasons, they had "too many" vitamins.

Orange juice has been vigorously endorsed by health workers and the medical profession in Peru; indeed, Espinos mothers refer to it as something "recommended by doctors." It is regarded by villagers as desirable supplementary fare for adults, particularly the sick, and for children of school age. However, no village mother considers orange juice to be appropriate for the infant who is still subsisting on milk. Orange juice is inadvisable fare, as she sees it, precisely because the child is consuming only milk. Not until the child has acquired the resistance to be able to withstand the ingestion of fruits or other solids is he believed prepared for orange juice.

IMPLICATIONS

Examination of dietary practices associated with early infancy, pregnancy, and lactation in Espinos reveals them to be not a collection of fortuitous customs but a coherent body of belief and behavior. Customs link to and support one another, being integrated in ways that are meaningful to villagers, however strange they may appear to outsiders. For example, during the first three days of life the mother does a series of things: she offers oiled cotton to the infant; she withholds the breasts; she discards her colostrum; she takes a laxative. To the observer, these practices may seem unrelated. To the mother, however, they are essential parts of a logical sequence having to do with eliminating wastes from both herself and infant and preparing both for the business of suckling. Underlying the specific practices are ideas which are geared to one another and to the community's entire way of life, or culture.

To digress briefly, culture is defined as the way of life of human groups, those aspects of human existence comprising man's nonbiologic inheritance. For a given society, it is the characteristic design of living, providing the guide-lines by which the behavior of members is regulated. Via processes of growing up and of living with his fellows, the individual acquires his group's culture, thus equipping himself with a screen of values and perceptions through which he views his universe.

Two sectors of cultural belief appear to have especial bearing on dietary patterns. One has to do with conceptions of food; the other with conceptions of the body. Mothers of Espinos make neither indiscriminate nor random use of their food horizon. Instead, they utilize it selectively, in accord with distinctions as to the innate qualities of given foods and their propriety for infants and for pregnant and lactating mothers. Whether the distinctions—hot-cold, light-heavy, and others—have objectively verifiable bases, they nonetheless link to deep feelings and act as one set of effective controls over the dietary patterns of infants and mothers.

In turn, conceptions of the body—or "body images," as the term has sometimes been used—also underlie and overlie specific food behaviors. Body images of Espinos residents include conceptions of the structure and parts of the body, its inner opera-

tions, effect of various foods on it, and its ideal external appearance. Thus, dietary patterns are related to such body images as the dirty stomach, the effects of particular foods on fetus and mother, the waste-product character of the colostrum, and the desirability of arriving at term with minimal weight gains and a small baby. Relating to infant feeding in particular are the mother's images of the nature of the infant organism and of its processes of physical growth and development.

Espinos receives but a trickle of nutritional information, apparently too scant a flow to have noticeable impact on food practices. Yet the significant point is not that mothers do so little with it, but they do so much. They use their meager information about orange juice to define it as beneficial for nearly everyone but babies. Similarly, they take the little they know of vitamins as warrant for regarding them as inappropriate for the pregnant. In brief, receiving new information, mothers of Espinos infuse it with their own cultural content, effectively reversing its intended objectives in the process.

The foregoing does not show that Espinos mothers are "ignorant," unless one uses the term solely to mean that they have little up-to-date knowledge about nutrition. In a sense, information gets reinterpreted not because Espinos mothers know so little but because they know so much. New information is received not into a knowledge-vacuum but into a pre-existing system of meanings, premises, and knowledge. Like people everywhere, residents of Espinos perceive new knowledge through the filter-screens provided by their cultures.

SUMMARY

Cultural factors involved in the dietary patterns of early infancy and of pregnant and lactating mothers are described for Espinos, a Peruvian coastal village. During the first three days of life, mothers do not feed infants but offer them cotton dipped in laxative oil. Mothers discard their colostrum and take laxatives before commencing to breast-feed infants following the third day. Infant diets tend to be minimally supplemented for six months or more and consist almost solely of milk. Expectant mothers restrict intakes of meat, eggs, and fresh fruit and vegetables; diets of lactating mothers are similarly restricted.

Espinos residents have beliefs concerning foods, the body, and dietary needs that support the particular dietary and infant-feeding practices followed by mothers. As a result of cultural food restraints, diets apparently worsen in quality during pregnancy and lactation. Conceptions of the body are also integral to the ideas and motivations which regulate maternal-infant dietary routines.

Espinos receives a trickle of nutrition information. Vitamins and orange juice are re-defined and regarded as inappropriate during pregnancy and infancy.

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Obesity Is a Complex Problem

The best hope in combating overweight is in prevention rather than attempts to cure, according to Charlotte M. Young, Ph.D., School of Nutrition, Cornell University, Ithaca, New York. In speaking before the Weight Control Colloquium at Iowa State College, Ames, in January, Dr. Young reported that under circumstances as ideal as they could be made, treatment of over-weight has been discouraging.

In her experience, about one-fourth of the patients have been reasonably successful in weight reduction, although only about one-tenth achieved their ideal weights. Another fourth had some success; another fourth lost some, but were not considered really successful, while a final fourth were complete failures or actually gained weight while under therapy. These figures, she said, probably would be even more discouraging if taken after a considerable period of time following therapy. Yet results were as good or better than similar records of treatment of obese people elsewhere.

"We felt that success was directly related to apparent emotional stability of the patient. Also, success in weight reduction seemed to be related to the age of onset of obesity in that those who developed obesity as children appeared to be much more refractory to treatment than those who became obese as adults." The rate of weight loss also tended to decrease as the period of therapy increased, although there were a few who showed a reverse tendency.

She recommended that for best results, therapy should be directed toward weight reduction in the early stages of obesity. In attempting treatment, weight reduction should not become a moral issue; the therapist should not scold or sit in judgment. Modern living increases the imbalance between energy intake and output. From a physical standpoint, we are getting lazier. This, coupled with many things which increase energy intake such as attractive food displays and advertising, entertainment, and anxieties, results in weight increases, particularly in the middle years.

Evaluation of a Nutrition Program[1]

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THE ultimate objective of a nutrition program is the establishment and maintenance of the best nutritional state among members of the population served. Progress toward this objective may be expected to help reduce morbidity and mortality, the ultimate objective of any health department's activities. Stated in more popular terms, the nutrition program is intended to help people enjoy a longer and more productive life.

"Best nutritional state" is not definable at present, but Sinclair (1) offers a practical definition for normal nutriture: "the state in which function and structure are unimpaired by nutrition, and the reserves are adequate for the usual needs of the body." The ideal evaluation would be to set up a study in which the deviation from such a standard would be determined on two comparable samples of the population. As the only variable, one sample would be exposed to a nutrition program. Such a program might involve the improvement in quality of diets in nursing homes. Re-examination of both groups for nutritional status at the end of the program should reveal whether a change had occurred.

This ideal technique of objective evaluation is not feasible in most nutrition programs, and it usually would be an undertaking larger than an entire program. Even though such a study may never be done in a particular unit, the same underlying principles may be applied to some extent in the evaluation of certain aspects or of specific components of nutrition programs.

Intermediate goals are closer to us because they involve present actions or attainments which will lead later to the enjoyment of a longer, more productive life by the persons reached. The intermediate goal of a nutrition program is to effect the wider use of nutritional knowledge. It is immaterial whether this be accomplished by a nutritionist giving a dietary instruction service to individuals or groups, or by a program of education and consultation for professional persons who, in turn, deal directly with the public. Both aim for the same result, although the latter is a more efficient use of the nutritionist. A particular circumstance may demand a judicious blending of the two approaches. Where a program operates for the immediate benefit of other professional people, we are further removed from the ultimate consumers of our services, the effects are diluted although more persons may be reached, and the problems of evaluation are compounded.

In the initiation of new programs, some criteria of effectiveness and procedures for evaluation may be built into the plan for the program before the activity is started.

The problem before the Bureau of Nutrition of the State of New York today is, however, to determine the effectiveness of existing programs. These are activities which, for the most part, have been in existence for some time and are inextricably bound up with the programs of other bureaus and offices. They are in the nature of educational and consultative activities to other professional personnel, both within and outside the State Department of Health, who actually provide the services.

This evaluation of the activities of the Bureau of Nutrition is part of the evaluation of the programs of all of the bureaus within the Division of Medical Services of the State Department of Health.

It was decided on a Division basis that the process of evaluation would be developed as follows: The *first* phase would be an analysis of the data we now have, including any evaluation studies already completed. It would delineate to the fullest extent possible, on the basis of available material, what we are doing. The *second* phase would consist of describing the material and methods of approach needed to provide more complete evaluation. The *third* phase would be to outline whatever suggestions regarding revisions of programs and new programs that may arise as a result of the entire evaluation procedure. This report is concerned mainly with the first phase.

CATEGORIZING

As the first step, the present actions or attainments which are intended to lead later to a reduction

[1] Presented before the Sections of Dental Health, Food and Nutrition, Health Officers, Public Health Education, Public Health Nursing, School Health, and Statistics of the American Public Health Association in Buffalo, on October 12, 1954.

of morbidity and mortality were to be divided into meaningful categories. A category was defined as any particular nutritional problem around which certain activities are organized. Each activity of the Bureau was to be specified and related to each category so that the effect of each activity could be studied against the total need within the category.

Meaningful categories were selected. These are our "targets" in the population—the people for whom we work. The first category consists of a group embracing the entire population, for some of our activities are of a general nature and not directed towards any particular group. This is called "All People." Other categories consist of groups for whom more specific activities are developed. The first major division is between the well and the sick. The categories for well persons are made according to age or physiologic state. They are: pregnancy, infancy, early childhood, late childhood, and adolescence. Those for the ill population include: obesity, tuberculosis, physical handicaps, the acutely ill, the chronically ill, the malnourished, and others. This left uncovered two situations in which service is frequently given. Thus, a category was created for "People Fed in Groups," where the problem is peculiar to group feeding; the other covers "People with Limited Food Budgets." This term was decided on because the problem is not necessarily limited to those with low incomes. Both of these categories cut across all of the others, and it is only where the services or activities are expressly on group or economic problems that they are used.

IMPROVING REPORTS

The second step consisted of a review of the monthly reports of the individual nutritionists and of the Bureau for 1952, the last complete calendar year, for the purpose of fitting accounts of work done into these categories. This left a considerable number of activities which were temporarily classed as miscellaneous to be developed into specific topics later.

The process of assigning each activity to a category was especially rewarding, because it pointed up several of the weaknesses of our system of preparing monthly reports and some of the unrealized inadequacies of the reports themselves. We decided to make the best use of the data we had. But, more importantly, we decided to improve our reporting so that future data would have greater value. This was accomplished by lengthy discussions involving the entire Bureau staff at regularly scheduled, monthly meetings over a period of six months. During this time there was an evolution from the old method of reporting, which was more an accounting of time spent, arranged systematically according to the agencies, organizations, and persons with whom we work, to a more meaningful record of activities directed toward the "target" in the population. As an example, participation in an institute for nursing home operators, without qualification, as it was formerly recorded, is now reported in the category of the chronically ill, using the same type of description as before. This refers the activity to the people for whom we work. Although there was never any question about whom we were serving, recording it in this way places the goal of the activity in proper perspective and stimulates the thinking through of the reasons and objectives for any activity.

The several discussions prompted the staff to suggest replacing the old system by reporting work done according to the categories described. Furthermore, these discussions helped to develop each staff member's understanding not only of the need for information about who, what, why, when, where, and how of each activity but also about the need for information classed as "diagnostic research" in the region of the state for which she is responsible and the need for established criteria to gauge the effectiveness of her activities. This is a development beyond the concept of a consultant passively waiting for problems to be given her to the acceptance of an active role, with a sense of responsibility and initiative, in assessing the needs of her area and figuring out ways to meet them. The value of these discussions was greatly enhanced through our practice during the last two years of rotating the responsibility of compiling and editing the Bureau's monthly report among all staff members under the general guidance of the associate nutritionist, who directs their activities.

In addition to providing supportive nutrition services through consultation and education of public health and other professional personnel who deal with the public directly, considerable other work is done on a long range basis which is presumably more important, less tangible, and even more difficult to evaluate. This includes work with institutions offering professional training in nutrition and with professional organizations; work being done toward coordination and integration of nutrition services within and outside the Department of Health; consultation to local health units and other agencies on development and administration of the nutritional aspects of their programs; recruitment and training; research; and evaluation. These became categories and the miscellaneous catch-all was abandoned.

At the end of 1954, we had a complete record with sufficient incidental data to enable us to know all of our activities for particular population groups during a year. We shall relate this information to the total need for such activities and determine what still needs to be done. Although we will not know all we should, we shall have a sound beginning.

SUMMARIES FOR EVALUATION

So much for getting the facts about our activities and arraying them in a useful manner. During the past twelve months, other conferences with the administrators of the Division of Medical Services re-

sulted in the development of an outline for presenting the data available for 1952 for evaluation purposes. Information about each category of activity was presented under the following headings: the evidence for a program, enumeration of existing activities, the evidence of effectiveness, other activities that might be tried, and conclusions which the administrators could use to help them appraise the report.

Since no objective criteria for measurement had been set down in the past and since no systematic effort or special study of a particular activity had been done, there were no activities about which one could make a direct, objective evaluation. There were pieces of evidence suggestive of the extent of coverage in a few activities and some unsolicited impressions from professional personnel with whom we worked in 1952. However, despite its numerous limitations, it *is* a concrete summary of recent activities in a nutrition program. It served to confirm some impressions and also held a few surprises. It should assist the administrators in making decisions as to priorities for programs and assist the staff of the Bureau in getting support for needed activities and protection from pressures to initiate or continue ones of questionable worth. For the future, this beginning should provide a solid framework for further program development and more objective evaluation.

RESULTS OF EVALUATION

As for evaluation itself, all of our activities have arisen from legitimate needs, and for reasons of greater or lesser importance. We have tried to meet the needs according to our means and the circumstances. We have initiated new activities and abandoned those of little worth or those which have outlived their effectiveness. In ordinary life, this is done by everyone every day in instances where advantages and disadvantages can be recognized. This procedure fails where ordinary observation and comparisons offer nothing, or where the activity is of such minor value that little difference would result from changing to another way.

As an example of the above in which no formal attempt at evaluation was made, but which resulted in a change in methods, the following may be cited. Nutrition teaching done directly by the nutritionist to mothers in their homes or in small groups and to individual nurses was part of a concerted effort by a team of professional workers from the Department of Health to reduce the very high maternal mortality in a rural area in New York State. The effort had dramatic success, but it was impossible to assess the contribution of the nutritionist as such. One result, however, was that nutrition instruction became increasingly a part of the in-service training of professional workers so that, for example, the nurse could teach nutrition in each of her home visits and adapt it to the needs of the individual families. In our written materials, food needs were no longer described separately, but were incorporated in published materials directed toward particular population groups which were prepared in collaboration with medical and nursing consultants. The nutritionist ceased meeting directly with mothers and was able to devote more time to in-service training which both enhanced the proficiency of other professional personnel and provided a far better service to much larger numbers of mothers and children.

An example of a technique for evaluating the more immediate effectiveness of staff education may be described. Before working with public health nurses who teach mothers' classes, we assess the nurses' knowledge of nutrition in pregnancy and how they conduct the classes. Then the nutritionist conducts staff classes on nutrition in pregnancy. Subsequent mothers' classes taught by these nurses are observed by the nutritionist. In addition, the opinions of the supervising nurses are obtained. This gives some measure of the effectiveness of our educational efforts with the nurses. Additional information may be obtained from the mothers about their knowledge of nutrition, and the nurses may observe any changes in nutritional practices in the home. This illustration points up the fact that much of the evaluation of the effectiveness of public health nutrition activities of this sort must be done with the help of those professional persons who are actually carrying the program to the public.

Although this type of service lends itself more readily to some degree of evaluation, the results of consulting with other departments and organizations are somewhat less susceptible to objective measurements of their effectiveness. Still, beginning with a clear statement of what is intended to be the immediate accomplishment, its actual achievement offers evidence of effective activity, provided the events that are presumed to follow actually continue uninterrupted to the benefit of the ultimate consumer.

Examination of purpose in the light of the intermediate goal, ultimate objectives, needs, resources, and priorities of other activities determines its validity. A willingness to find out if a purpose has been accomplished is the keystone of evaluation. A criterion of effectiveness should be established in advance. Selection of an objective criterion is usually possible, even though it may take one only a little way toward estimations of ultimate effectiveness. It is on such a modest start that progress in evaluation of nutrition programs will be made.

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Tailor-Made Recipes for Modern Food Service[1]

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STANDARDIZED recipes, if they are truly functional, can be sharp tools for the dietitian just as the well honed scalpel can be the right instrument for a specific purpose for the skilled surgeon. However, just any recipe (even one from a reliable source) may not be the sharp tool you need to do *your* specific job. Every recipe must fit the special requirements of *your* food service. A tailor-made recipe is one which fits the specific needs of a particular food service operation for (a) quality, (b) portion size, (c) total yield, and (d) raw food cost.

Even standardized recipes from the most reliable sources have certain limitations which you must consider carefully so that they will really do the job expected of them. When adding a new recipe to your collection or revising an old one, you must check carefully what needs to be done to adapt it to *your* needs. Does the original recipe have the exact yield desired? Do the directions for pans and portions fit *your* equipment? Is the portion size such that the item can be sold at a price satisfactory both to your customer and your profit percentage? Is there anything ambiguous in the quantities of ingredients or preparation instructions which might result in lack of quality control? Are the directions for mixing and for temperature and timing of cooking or baking accurate for the quantities you plan to make? In tailoring the recipe for your own use, you should answer all these questions carefully and make whatever changes seem indicated to do *your* particular job.

A tailor-made standardized recipe must pass the following tests:

(a) A well arranged, uncluttered format with enough blank space for easy reading

(b) Neat columns for ingredients

(c) Limited number of yield columns

(d) Brevity and clarity of directions

(f) Natural and orderly arrangement of ingredients

(g) All necessary information about yield, pan size, baking time and temperature, and cutting and serving instructions

In Figure 1, the sample recipe illustrates these basic points.

RECIPE FOR A TAILORED RECIPE

1-ESSENTIAL INFORMATION
2-BRIEF, CLEAR DIRECTIONS
3-NEAT COLUMNS-UNCLUTTERED FORMAT

12 X 22 X 2" PANS — CUT-48 — GINGERBREAD — 350° F. OVEN — 40 TO 45 MIN.

INGREDIENTS	NO. OF PANS 1	2	3	PROCEDURE
HYDROGENATED FAT	9/12 oz			CREAM TOGETHER 10 MINUTES, PADDLE ON MEDIUM SPEED.
SUGAR	9/12 oz			
EGGS	6/12 oz			ADD GRADUALLY, BEAT TILL FLUFFY.
BAKING MOLASSES	1 1/3 oz			ADD SLOWLY, BEAT TILL FLUFFY.
CAKE FLOUR	1 lb 8 oz			SIFT TOGETHER.
CINNAMON	2 3/4 t			ADD ALTERNATELY WITH WATER, BEAT 2 MIN., MEDIUM SPEED. SCRAPE DOWN AND BEAT TILL SMOOTH.
CLOVES	2 3/4 t			
GINGER	2 3/4 t			
SALT	2 1/2 t			
SODA	1 oz			
HOT WATER	2 1/2 c			
BATTER WEIGHT	6 lb			SCALE BATTER INTO GREASED PANS, 6 lb PER PAN, FOR BAKING.
COST PER PAN (est.)	.9038			

FIG. 1. *Sample of a standardized recipe, tailor-made for a given situation.*

Let us look at the essential steps in successfully tailoring a recipe from a reliable source to fit your own needs.

FORMAT

First, careful thought should be given to the format—its size for convenience in handling and filing and its legibility for easy reading. Never forget that these two things may greatly influence both the quality of the product and the attitude of the employees toward using recipes.

A duplicate of the neat, little desk file for use in the kitchen may give disappointing results. Small cards with elite type or fine print, crowded columns, and too brief directions may ruin the chances of enjoying the many advantages of standardized

[1] Presented at the 37th Annual Meeting of The American Dietetic Association in Philadelphia, on October 27, 1954.

recipes. As food managers, it might pay you to count the number of "squinters" and bifocals in the kitchen before you decide on the format for your recipes.

In selecting a good format, you must *visualize* the recipe in use in a working situation and *not* simply select a format of the size which will be easy to file or to be read by someone seated at a desk. I am afraid we sometimes tend to forget that recipes must be in a form easily read by a worker who is moving about quickly. Both good recipes and good workers are frequently blamed for product failure, when the failure might more logically be attributed to a hard-to-read format.

A specific space should be allotted for panning and portion instructions, cooking temperature and time, and pan sizes. It is a good idea to set up your recipe format so that the same kind of information appears in the same relative position on every recipe. For example, baking temperature might always be placed in the upper right hand corner for all items. The employee quickly learns to check there and to set the oven so that it will be at proper temperature when the product is ready to bake.

Many people feel that horizontal shadow lines between ingredients on a recipe are a great help to the busy cook. Remember that your cook is glancing at the recipe quickly as she weighs different ingredients; she isn't sitting or standing quietly and *reading* as you might do in checking a recipe. If you've ever found yourself reading down an extra line or over an extra column in an attempt to balance a ledger, you know that such things happen.

Next in importance, keep the format uncluttered. Allow enough space so that essential information stands out in a field of white or plain color if you want your recipe read and followed. Crowded columns for listing amounts of ingredients or too many columns for different yields on a single card have undoubtedly contributed to many product failures. Like an effective window display or a good advertisement, a good format for a recipe depends on an uncluttered background for emphasis of important things.

Your particular food service may require more than one specific yield for certain items. Using two or even three columns for listing amounts of ingredients serves this purpose well. However, the use of more than three columns is likely to result in confusion and mistakes. If your production requires more than three different yields, it may be advisable to have two or more cards for the same recipe to take care of the variations in yield. This is safer than attempting to put too much on a single copy.

INSTRUCTIONS

Strive for brevity of directions—but not at the expense of clarity. Although all of your production people today may be experienced and able to read

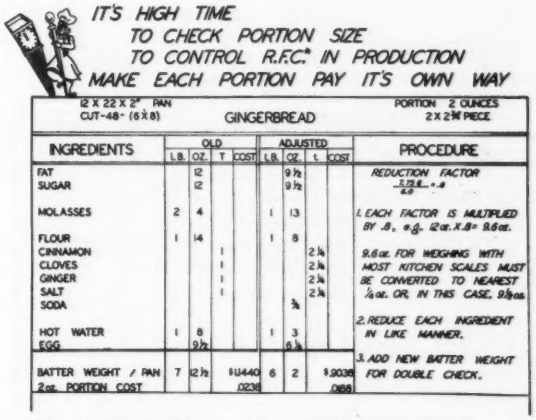

FIG. 2. *Standardized recipe tailored to meet specific yield requirements.*

* Raw food cost.

between the lines, the day may come when you will have inexperienced workers who will need to follow instructions to the letter to produce food of consistently high quality. If you err a bit on the amount of detail of instructions to be included in a recipe, *do* let it be on the side of too much rather than too little.

Be careful about word choice and make certain that instructions do not include any ambiguous words which may lead to misinterpretation. If you mean "whip," or "fold," or "beat," say so; don't simply say "mix" and expect the cook to figure out the best technique.

Give some thought to the order of listing of ingredients. More and more there is a tendency toward listing ingredients in the sequence in which they will be used in the recipe. This can save time for the cook, avoid confusion, and go a long way toward eliminating costly and embarrassing mistakes by your workers. The practice of grouping ingredients which are to be added as a unit is also helpful in writing a usable recipe.

Placing directions in relation to the ingredients so that the work progresses easily and quickly is important, too. Should the instructions be listed in numbered steps at the bottom of the recipe or should they be blocked across from the ingredients concerned? The latter method has much to recommend it, although it may take a bit more space.

DATA TO INCLUDE

And, now, suppose we get to the details of the information which should be included on every well written recipe.

First, of course, be sure to include the *name* of the item in a conspicuous place. You may also find it helpful to include a code file number which could also be used in setting up a cost notebook or for identifying products on the back side of counter signs.

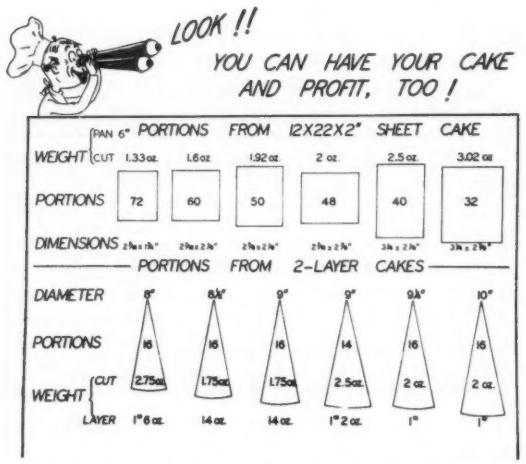
LOOK !!
YOU CAN HAVE YOUR CAKE AND PROFIT, TOO !
PAN 6" PORTIONS FROM 12X22X2" SHEET CAKE
WEIGHT CUT 1.33 oz. 1.6 oz. 1.92 oz. 2 oz. 2.5 oz. 3.02 oz
PORTIONS 72 60 50 48 40 32
DIMENSIONS
PORTIONS FROM 2-LAYER CAKES
DIAMETER 8" 8½" 9" 9" 9½" 10"
PORTIONS 16 16 16 14 16 16
WEIGHT CUT 2.75 oz. 1.75 oz. 1.75 oz. 2.5 oz. 2 oz. 2 oz.
LAYER 1" 6 oz. 14 oz. 14 oz. 1" 2 oz. 1" 1"

FIG. 3. *Variation in portion sizes resulting from lack of portion control.*

Another important consideration in recipe tailoring is adapting the yield so that it will give *exactly* what you want—the number of portions you desire and the size portions you need to keep your customers happy and your food cost in line (*Fig.* 2). Your file may contain some over-yield recipes which may be costing you profit every time you serve them. A little checking may tell you some very helpful things.

The portion size, too, must be determined. Although this seems rather elementary, we learned some startling things about portion sizes of cakes in a recipe workshop we held last summer. All ten participants *thought* they knew the size portions of cake they had been serving. However, after analyzing their own recipes in the light of their panning and cutting practices, they found that portions actually varied from 1.3 to 3.0 oz.—and each had picked out a 2-oz. portion from a group of various size pieces as the size she *thought* she was serving. Just to give you an idea of how far off base our illusions can carry us sometimes, we cut from sheet and layer cakes the size portions our checking showed that they had been serving (*Fig.* 3).

You can imagine that these facts were pretty hard to believe—especially when all ten had been reasonably sure they were doing about the same thing! You might find an illusion or two floating around in your kitchen, too, if you really set out to look for one! And, remember, both your customer satisfaction and your profit may be involved in such an illusion.

REPRODUCING COPIES OF RECIPES

Another point we should mention is the matter of reproducing multiple copies of recipes for use in a master file or working files. One method, of course, is printing, which is quite expensive for a food service requiring only a few copies of each recipe. There is also the old stand-by, the typewriter, for providing individual copies. This method, too, has its well known limitations: it is expensive from the standpoint of labor both for typing and for proofreading. This latter function, if carelessly done or omitted, can be the source of many expensive errors and product failures. Many an inferior cake or meat loaf has had a typographical error on its family tree.

A relatively new method of producing multiple copies is known as the Ozalid process. To make this kind of duplicate, a master copy is typed with a carbon ribbon on specially treated paper. File cards or sheets may then be produced in any number at any time by processing from the master copy. The only proofreading required is on the master copy. The initial cost of the master copy is only a few cents more than a regularly typed recipe, and processed copies cost from 2 to 5 cents each. This method has much to offer the progressive food service operator for minimal expenditure per copy—and it means you can really preserve the results of the effort which goes into tailoring a recipe to do exactly the job you want done. Many photographic studios offer this service, and small equipment to do the job is also available for less than $500 for those who might need to make multiple copies of many different things, and thus justify such equipment.

SUMMARY

A tailor-made recipe, standardized for your particular operation, has seven important facets, if it is to do the job for which it is intended—that of improving your food production:

(a) Well arranged, uncluttered format or layout.
(b) Neat columns for ingredients.
(c) Limited number of yield columns.
(d) Brief, clear directions.
(e) Careful word choice.
(f) Natural and orderly arrangement of ingredients.
(g) Essential information.

Standardized recipes are fine—as far as they go. But reputations for excellent food are built on attention to "the little things"—and most important among these is the tailoring of every recipe to do the specific job you want done in *your* particular food service. Tailor-made recipes will help you to know where you are going—not just where you have been—in quality control, portion and yield control, and cost control. Can you any longer afford *not* to invest the time and effort required to tailor the recipes in *your* kitchen?

See pages 950 through 958 for the Tentative Program of the 38th Annual Meeting of The American Dietetic Association and other convention news and planning.

Current Comment

Cycle Menus, Tempered with Flexibility, Have Advantages[1]

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Complacency yawns before us constantly, and it can be very pleasant. I know—I find myself there often, and it takes a painful nudge to get out of that rut. Until about two years ago, I was happy in my complacency whenever cycle menus were mentioned. I would make the mental reservation, while listening to any discussion of cycle menus, that they were all right for others, but not for me. My food service was to remain individual, with no danger of customers' complaints about the sameness of the menu. I cited myself arguments against such a system: lack of variety, monotony, and inflexibility.

As time went by, the menus at St. Luke's became more diversified and required longer to write. There were two reasons for this. We had installed a pay cafeteria with selective service for our personnel, and we had instituted selective menus for all patients rather than only for private patients. Writing the various sets of menus was consuming an excessive amount of administrative time and, on occasion, assumed the proportions of a nightmare when printers' deadlines had to be met.

Obviously, something had to be done, and we felt that perhaps we should re-evaluate our thinking concerning a cycle pattern. After careful analysis of the past year's menus, we were reluctantly forced to admit that we were guilty, in spite of our best efforts, of many of the errors we considered to be ills of a cycle pattern. Occasionally we had the same combinations on the same day of the week. No matter how carefully we checked, small errors, sometimes large ones, would become apparent when the menus were in actual use. There was the week that we had overloaded the baker, and the week that the butcher had too little to do. There was the week we had used pineapple an excessive number of times, while the following week not at all. And, of course, there was the day that the menu read like an international convention, with French onion soup, Hungarian goulash, Viennese noodles, and Pennsylvania Dutch rice pudding! Here was that nudge, and my injured ego had to admit that we were not infallible, that our menus left room for improvement.

As a result of this analysis, we decided to set up a pattern that would be suitable for our operation and would require a minimum amount of our time, yet insure the quality of menu that we desired.

Having tentatively accepted the concept of cycle menus, we started to work in the spring of the year. Each week for four weeks we wrote our menus just as we had done in the past, spending perhaps more time than previously, in an effort to eliminate as many errors as possible. As the menus were served, we noted the errors uncovered in actual use. At the end of the four-week period, we went back to the first week, made the corrections that had been indicated, and repeated the set. After this set of four menus had rotated four times, we had made many changes from the original and had perfected them insofar as possible. We then started writing our second set of four-week menus, going through the same procedure. After this, we wrote a third set. We now have three sets of four-week menus (a total of twelve weekly menus), each written and corrected for the season of the year.

At the end of the year we were satisfied that we had achieved as much as we could in producing well balanced, pleasing menus. We had accepted cycle menus as a workable, convenient procedure.

FLEXIBILITY

With one year behind us, and with the bulk of the work involved in setting up a series of cycle menus accomplished, we continued to make a strenuous effort to prevent our original criticisms of this type of menu from becoming evident in our own pattern. We now spend one morning each week going over the set to be used. We frequently replace a planned entrée with a new recipe, keeping it on the menu if we like it, reverting to the original item if we don't. We may change the form in which a food appears in an entrée; for instance, we might change a grilled cheese sandwich to Welsh rarebit with bacon curls. Or, we may change a single day's meal pattern so as to use the dinner items at noon, and vice versa. On holidays, the day's menu on which the holiday falls must, of course, be changed, with the resultant necessity of changing the previous and following days' menus to accommodate the holiday. Many times it is simply a matter of shifting items from one day to another, but sometimes it means incorporating a new one altogether. When the planned menu includes an item that has increased in cost beyond our budget, we change it to perhaps a cheaper form

[1] Presented before the Illinois Dietetic Association in Chicago, on March 11, 1955.

of the same thing or to something currently plentiful. This, too, may involve changing on days other than the one on which the item appears. Also, we have, in the past six months made many changes in the dessert pattern to accommodate a change in personnel in our bake shop.

When we found it desirable to include a selective menu for our patients with diabetes, we were able to pattern this menu on our planned set with a minimum of additions and have felt that this problem was solved much more easily than it would have been had we still been planning weekly menus.

I have mentioned these points to emphasize the fact that when you use cycle menus, you are not through with them after the initial planning. You cannot sit back, breathe a sigh of relief, and never look at them again. Our policy is that cycle menus are to be used as a guide and a convenience, not as a fixed pattern. Flexibility must be the keyword in the use of any cycle menu pattern.

ORDERING ADVANTAGES

In addition to having achieved what we feel is an acceptable menu pattern with a minimum of time and effort spent weekly, we have enjoyed benefits that we had not anticipated. While we set these menus up primarily to conserve administrative working time, we have also been able to establish records that we have found valuable in estimating the number of servings required. We know from the records, for example, that when the cafeteria has beef stew and shrimp salad as a selection at noon, 63 per cent of the customers will take an entrée. Of this 63 per cent, 39 per cent will take shrimp salad, and 61 per cent beef stew. If the choice is between frankfurters and chicken chow mein, 90 per cent will take an entrée, with the division at 78 per cent for frankfurters and 22 per cent for chow mein. The percentage ratio holds true whether there are 400 or 600 customers. We also make notations of the weather at the time of service, because extremely cold, hot, or inclement weather can change the pattern of customers' selection. Similar records are kept of selection of entrées by patients.

These figures form the basis for our ordering of raw supplies. We have noted a decided reduction of waste, due to more accurate ordering and less over-preparation. These records give us a surprisingly accurate guide to anticipate the next day's food order for the patients, as well as for the personnel. One of the primary advantages of these records is that when it is necessary for a dietitian unfamiliar with the routines of ordering for the cafeteria or the main kitchen to take over these duties, she is able to do so with a minimum of effort or error.

IMPROVED EFFICIENCY

Cycle menus have also helped to standardize the routine of preparation in the kitchen. As menus are repeated, the procedures involved are also repeated, so that they, too, become standardized. There are fewer emergencies in miscalculation of time. A pattern of production has been set in which the personnel, having performed the same combination of tasks before, are better able to plan their time and efforts to good advantage. I had this brought to my attention in a recent conversation with the chef, who expressed the same thought a little differently. We were discussing a cook's vacancy which we were having difficulty in filling, and Joe quite casually made a suggestion that to me was amazing. He suggested that we solve the problem by eliminating the position. Now I have worked with Joe for ten years, and this was the first time I have heard him even hint that the cooks weren't practically ready to collapse from overwork (although they would carry on). He noticed my amazement and went on to justify his stand by the comment, "The menus have been coming along lighter than they used to, and there isn't as much for the fellows to do." In reality, the menu pattern today is more varied and complex than it was two years ago, and we are feeding more people than we did then, although we have not changed the number of cooks.

Of course, the final proof of the pudding is in the eating, and we feel that the reaction, or I should say the lack of reaction from personnel, patients, and the professional dietary staff justifies the use of this particular tool. We, in administration, feel that our menus today are better balanced, show better variety, and are more uniform cost-wise than they were before we instituted the cycle system. In addition, we have released valuable administrative hours that can be devoted to other problems and have built up a set of records that help us maintain better cost control with less effort.

Pleasing Service for Private Patients

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New England Center Hospital
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Can the business executive, accustomed to superlative food and service at his club or some well-known hotel, and the club woman, whose regular day includes a luncheon, tea, or dinner at a tea room or club, be offered extra consideration when he or she becomes a patient in a hospital?

As a dietitian, I leave the medical care of such patients to the administration and the doctors. But, I realize that I have an important part to play in making their hospitalization as pleasant as possible by providing them with a menu which will not only fulfill their food needs but which fits in

with their customary living patterns as nearly as possible.

The New England Center Hospital cares for all classes of people, and like most hospitals, we have an area of private rooms for patients who want and can afford extra services. With a capacity for eighteen people, patients admitted to this wing represent 7 per cent of the hospital's total monthly admissions.

Our over-all hospital diet is carefully planned and well served, and we are proud of the comments on our food. However, since we felt that the service to this special area might be improved, we queried a number of these patients. We learned that an additional charge for specially prepared food and extra consideration would be quite acceptable to them.

To implement our plan, a full-time cook was employed and is now assigned to the kitchen that was already a part of that wing. To make the kitchen as functional as possible, and as much like the kitchen of any well planned home, double boilers, parfait glasses, electrical appliances, and other conveniences have been added as required.

Breakfast for these patients is handled by the regular senior dietary aide before the cook comes on duty. Then, working from 10 A.M. to 7 P.M., the cook prepares all other meals for this wing, starting "from scratch," with the exception of the soup of the day which she orders from the main kitchen.

The patients' choice of food is practically unlimited. A daily selective menu is prepared. In addition, filet mignon, lamb chops, chicken broilers, and other similar foods are always available, and other foods are prepared as the patient might wish. Also, service is at the convenience of the patient.

A second new feature which the dietary department has added to the service for this wing is a regular afternoon tea, which is served in an appropriate fashion to patients and their visitors. An attractive tea wagon is set up with linens, sterling silver tea service, and bone china (a gift from a patient who was delighted with the idea of afternoon tea). Freshly-made tea snacks, including therapeutic bits to fit into the modified diets, are served with the tea. The waitress is usually the cook herself or one of her capable dietary aides well-schooled in etiquette for serving tea.

When the augmented service was begun almost two years ago, the initial cost was $322. This figure included the cost of the tea wagon, silver service, and miscellaneous items for the kitchen, such as a domestic-model broiler, oven, waffle iron, pots and pans, measuring cups, special pastel trays, and a complete cover board for the work table. The only addition to the personnel was the cook, since the hospital regularly employs dietary aides to serve all meals, and the regular personnel assigned to that area take care of the service. The actual added service is covered by an additional charge of $2 a day to the cost of the room.

Tea, served from cart with fine appointments, pleases private patients

We have, we feel, adequately met a need that did exist—a need to satisfy a particular type of patient. Patients' reactions to these new services have been most enthusiastic; they are delighted with the quality and variety of the fare and the little "extras." The doctors find the patients in good humor and cooperative. This plan has resulted in excellent hospital-patient relationships and verbal bouquets from both the administration and the medical staff. In fact, this innovation has been so successful that requests for rooms in the wing have increased to the point where there is a waiting list.

Is Research Necessary for Equipment and Layout Planning?[1]

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Clinical Center, National Institutes of Health
Bethesda, Maryland

Webster has defined the word "research" as meaning "careful search" or "studious inquiry." I believe it is generally agreed that research is necessary for equipment and layout planning, but just what inquiries or planning must one make to provide dietary facilities that operate efficiently?

How does one proceed to do realistic dietary planning? Possibly the best way to present this subject is to describe for you the technique our

[1] Presented at the 37th Annual Meeting of The American Dietetic Association in Philadelphia, on October 28, 1954.

consultants have used in revising some guide plans in the Division of Hospital Facilities of the Public Health Service. There are six steps to follow:

(a) Determine your function or responsibility.

(b) List the operations necessary to carry out these functions.

(c) Select methods most practical to follow for each operation.

(d) Translate the above into a written program.

(e) Develop a plan of work flow.

(f) Select equipment by your own unit of measure.

Function of the Dietary Department

In order to provide the best patient care, you must first determine the function or responsibility of your department. Your targets fall into three main categories: to provide appetizing and nourishing foods as economically as possible for patients, personnel, and visitors; to provide instructions to patients—both hospitalized and out-patient—and to personnel; and to provide instruction and training for the non-professional staff of the department.

List the Operations Needed

Having determined the specific areas in which your functions fall, the second step is to list the operations needed to carry out these functions. Broken down, they would look something like this:

1. Menu planning for patients and personnel, both normal and therapeutic diets.
2. Purchasing of food.
3. Adequate food cost accounting.
4. Preparing food.
5. Serving food to patients.
6. Serving food to personnel.
7. Effective dishwashing for patients and personnel.
8. Planning for disposal of food waste.
9. Preparing milk and milk-substitute feedings for infants.
10. Selecting, caring for, and maintaining equipment.
11. Maintaining high standards of sanitation.

Selection of Methods

The third, and time-consuming step is to select methods that are most practical to accomplish the described operation. At this point, you can determine the work station and floor space that would be needed to carry out your functions and finally the equipment that would be necessary to perform the job successfully. In making your decision, be sure of facts—which means study of and research into experiences of others, as well as your own experience. Personal preference should always be secondary, for one must be in a position to support one's recommendations. You are certainly the best person to make these decisions.

Write Your Program

Step four calls for a written program. Programming means preparing a list of pertinent data about the hospital and your service, a necessary preliminary before plans for the work units can be made. This list will serve several valuable purposes. It will guide you in planning the rooms and stations of the proper size and shape to house and operate your equipment; it will assure the proper equipment to do a good job; and finally, it will be used by those who operate the department later. This list should contain such essential information as:

1. Who is to be fed and what will be the average number of meals to be served?
2. How are the patients to be served?
3. How are personnel to be served?
4. Type of sample menu to be served:
   a. Patients—morning, noon, and evening.
   b. Personnel—morning, noon, evening, and midnight.
5. What will be the needs for therapeutic diets?
6. What work stations will be needed to carry out food service for patients and personnel?
7. Will staples be kept in central storeroom or must plans be made for storing all dietary purchases in the dietary facilities?
8. Will any baked products be purchased?
9. Will ice cream be purchased or made? If purchased, how often?
10. How frequently can perishable items be delivered to the hospital?
11. What quantity of frozen food will be used?
12. What type of meat will be purchased—carcass or fabricated cuts?
13. What will be the source of ice for the hospital, particularly, for the personnel dining area?
14. What method of dishwashing will be used for patients and for personnel?
15. Where will coffee be prepared?
16. What size staff will be needed to operate the facilities?
17. Is space needed for teaching student nurses?
18. How will food waste be handled?
19. What space must be allowed for trash disposal?
20. What plans must be made for infant formulas?
21. What other special practices must be considered, i.e., isolation patients, pediatric service, research, pasteurization of own milk, and so on?

Plan Work Flow

Five, make a definite plan of expected work flow in each unit, as well as for the department as a whole. A diagram giving a graphic picture of how the units are expected to operate, will promote understanding by all involved with the planning. It will also help you make better decisions for efficient operation.

Select Proper Equipment

Step six is as important as any of the others, and one of the most time consuming. It is the selection of equipment as to size and type best suited for the job. It is, of course, closely tied in with the plan of arrangement, also. Before selecting or purchasing any equipment, from your experience and needs as indicated by your written program, you must set your own written standards for each unit. They will differ with each hospital or food service. By this I mean listing each unit of operation in your kitchen and in other service areas, and then determining the unit of measure for your specific operation. By unit of measure I mean the basis on which you plan your needs. Let me illustrate by listing questions to provoke specific answers.

RECEIVING AREA

1. Do I have a platform scale? This is the one essential piece of equipment in the receiving area. A scale with a springless dial face is more expensive, but it indicates an accurate zero when in balance. When out of balance, the deviation of the needle away from zero is immediately apparent.

2. Do I need a hanging scale for checking small items?

3. Do I have a truck for transporting deliveries? If space permits, a counter and truck should be placed in this area, but if a choice must be made, then the truck should be selected. It has been estimated that every time an employee walks 52 ft., it costs 1 cent—assuming that he is paid $1.00 an hour. A truck not only cuts down the steps required but also eliminates handling items one at a time.

DAY STORAGE

1. Have I provided adjustable steel shelving?

2. Are there metal cans on casters for storage of cereal products received in bulk?

3. Is there a step-ladder for convenience in handling food?

4. Is there a locked cabinet to take care of certain special items?

REFRIGERATED STORAGE

1. Do I have a potato peeler large enough to prevent an unnecessarily large number of runs in preparing the proper amount of potatoes for one meal?

2. Do I have a two-compartment sink in this area?

3. If I am using garbage grinders, do I have one in this unit?

4. If this is a combined vegetable preparation and salad unit, do I have sufficient table space and is the refrigeration convenient? Four linear feet of work-table space should be allowed for each preparation employee. The tables should be 4 ft. wide to provide sufficient area for spreading out materials.

5. Is there a vegetable chopper or an attachment to the mixer?

MEAT PREPREPARATION UNIT

1. Is there a meat block for cutting and trimming meats?

2. Is there a tool rack and table space for holding pans in which meat is placed as it comes off the block?

3. Has provision been made for a meat grinder or for an attachment to the mixer?

COOKING AND BAKING UNIT

1. Is the mixer large enough to mash potatoes for all patients at one operation?

2. Do I have a smaller bowl for the preparation of other items with the mixer?

3. Do I have a steam-jacketed kettle that will take care of soup for patients and personnel? One must remember in planning the size of the steam-jacketed kettle that only two-thirds of the capacity can be utilized.

4. Do I have a smaller kettle, such as a trunnion, for gravy, pudding, and so on?

5. Is my steamer large enough to handle all potatoes needed for one meal?

6. Do I have enough oven space to prepare turkeys for patients and personnel, or baked ham for all?

7. Do I have an oven that can be regulated for two purposes—baking and roasting?

8. Have I provided a portable cooking rack for receiving cooked items from ovens?

9. Is the deep-fat fryer adequate to handle the planned load? It will probably be used chiefly for the preparation of fried foods for personnel.

10. Have I provided facilities for broiling or top-range frying of foods for modified diets?

11. Is there a hood for adequate ventilation?

12. Are there sinks convenient to cooking area?

13. Is there a refrigerator for cook's use?

14. Do I need to provide for coffee preparation in the main kitchen? Is the capacity small enough to prevent left-over coffee?

15. Is there a cook's table in front of the cooking unit?

16. Is there a pot rack over the cook's table to hold utensils that will be needed in food preparation and serving?

17. Have I provided hand-washing facilities convenient to my employees?

POTWASHING

1. Have I provided a three-compartment sink equipped with a dial thermometer in the rinse compartment?

2. Do I have a waste grinder here?

3. Does the receiving table have a 3-in. upturned edge?

Having completed these six steps, you should be

able to select your equipment objectively, and order the size and type needed. It is then that arrangement of equipment begins. It should be placed to fit your plan of work flow. Although we must all make some compromises at this step, our work flow plans should always be kept in mind.

Reviewing the Plan

An effective job of planning for the needs of a dietary department is not complete and you will not have fulfilled your obligation until you have critically reviewed the plan that has been developed. This final review must be a cautious one and one to which considerable time must be given. I would like to suggest the following steps that could be used to determine if your plan meets your food service requirements.

(a) Check on arrangement. There are any number of check lists available in the form of questions to be used in evaluating your hospital dietary layout. One which I have found useful is *Planning, Equipping, and Appraising Hospital Dietary Facilities* (1). It begins with such questions as: "Are definite space and facilities provided for unloading and checking supplies?" "Does the area have access from the outside?" and so on.

(b) Another method used to check arrangements is mentally to trace the preparation a typical menu in the kitchen to show traffic lines. Using a different color of pencil for each food, draw continuous lines in the architectural plan to show the flow of food preparation. This will provide a visible means of checking traffic flow.

(c) We should next review the use of various items of equipment to be sure that the maximum use will be obtained from the equipment purchases and that no pieces are overloaded. This can be determined by charting several typical menus and checking both the various pieces of equipment that will be needed and the number of times and the hours they will be used in the preparation of one meal. Be sure, also, that the equipment is not overloaded in one meal.

(d) Another necessary check is on the storage space in your area. It is a tedious approach, but I feel it will pay dividends to list all pieces of equipment, regardless of how small, that will need to be stored in the area in which they are going to be used.

(e) A final step, just as important as any of the others, is to check the staffing needs. With the mounting cost and scarcity of labor, this has become a constant problem in the operation of a nutrition department. Some staffing costs can be eliminated if this is considered in the initial planning of the equipment.

Conclusions

Usually it is much easier to tell someone how to do something than actually to do it. I think everyone appreciates the fact that dietitians are so busy with daily work that they may have little time to carry out the planning methods outlined here. To gain this time, you may need to convince your administrator that he should relieve you of part of your regular work. A good selling point is that he will save money through planning and that an efficiently planned dietary service is capable of being used for at least fifty years.

I can think of no better final advice than that on a sign on a rough country road in Maine: "Choose your rut carefully; you will be in it for the next thirty miles." The same warning can be applied to hospital planning, and especially to food service: "Choose your plans and equipment carefully; you may be using them for the next thirty years."

REFERENCE

(1) Div. of Hospital Facilities: Planning, Equipping, and Appraising Hospital Dietary Facilities. Washington: Public Health Service, n.d.

Did You Know . . .

. . . that with blast freezing, the cells of the meat are not broken and the flavor and texture is the same as the original?

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. . . that the meat salesman of one well known purveyor must have a six months' training course before calling on his first customer?

. . . that he can teach you many things about new products?

. . . that he is prepared to compare his products in terms of cost, shrinkage, portion, perishability, and waste?

—*Excerpts from talk by Ruth Kahn, given at the meeting of the Texas Dietetic Association in Houston April 29, 1955.*

Book Reviews

Your Annual Meeting. By Bernard Carp, Ph.D. New York: National Publicity Council for Health and Welfare Services, 1955. Cloth. Pp. 168. Price $3.50.

Meetings of organizations in our democratic way of life are a reflection of democracy itself. The success of an organization and of its meetings depends on members' participation so that their wishes, their needs, and their interests are met at the "get together."

This book helps in planning for a successful meeting, whether it is a luncheon, a day-long, a week-end, or a longer session. While prepared for meetings of health and welfare councils, the information and suggestions are equally applicable to the meetings of state or local dietetic associations or other groups.

Careful planning is essential if a meeting is to be successful. Suggestions for organization of the committee, the steps involved in preparation and presentation of the program, and securing of publicity are given in a way helpful to either inexperienced or experienced officers. One chapter makes suggestions for giving of annual reports and the interpretation of work of the organization, which may be somewhat difficult to make interesting.

Audience participation, group discussions, workshops, visual aids, dramatization, and exhibits are all covered in Dr. Carp's well written book. There is a checklist of "Things to Remember" and a "Time Table for Chairmen," in the appendix. It is apparent that Dr. Carp has had wide experience to be able to present so much practical aid, and in an interesting way.

It might be desirable for state associations to have a copy of this book in the president's file.—*Lillian Storms Coover, Ph.D., Ames, Iowa.*

A Handbook on Quantity Food Management. By E. Evelyn Smith. Minneapolis: Burgess Publishing Co., 1955. Paper, spiral bound. Pp. 224. Price $3.50.

Although this book is planned for use as a laboratory manual for institution management classes, it includes a wealth of informative material for the person responsible for any type of food production and service. Included are discussions of organization and menu planning, controlled preparation procedures, modern and mechanized food units, standardization of recipes and portions, work simplification, conservation and waste control, merchandising, service of food, personnel management, and suggestions for the quantity cookery laboratory.

Throughout the manual, it is apparent that the preparation and service of quality food is the major objective. Information regarding other aspects of organization and management, such as the various tools and controls and their use, is so integrated that their importance in achieving quality food production is emphasized.

For the college or university teacher with little experience in planning for and teaching laboratories in quantity food preparation and management, as well as for the experienced teacher, this manual should be an excellent guide. The comprehensive, up-to-date reference lists at the end of each chapter include sources of information for further study. Most of the material is presented in outline form which is easy to read and to use for reference when information is needed for immediate use.—*Beatrice Donaldson, Ph.D., Associate Professor, School of Home Economics, University of Wisconsin, Madison.*

RECENT BOOKS RECEIVED

Feeding Your Child. By Samuel M. Wishik, M.D. Garden City, N. Y.: Doubleday & Company, Inc., 1955. Cloth. Pp. 223. Price $3.50.

Foreign Dining Dictionary. By Robert Jay Misch. Garden City, N. Y.: Doubleday & Co., Inc., 1955. Paper, vest-pocket size. Pp. 64. Price $1.25.

Experimental Cookery. 4th Edition. By Belle Lowe. New York: John Wiley & Sons, Inc., 1955. Cloth. Pp. 573. Price $7.50.

Quantity Recipe File. By Lenore M. Sullivan. 5th edition. Ames, Iowa: Iowa State College Press, 1955. 4 x 6 cards. Price $4.

1955 Medical Progress. Morris Fishbein, M.D., Editor. New York: The Blakiston Division, McGraw-Hill Book Co., Inc., 1955. Cloth. Pp. 346. Price $5.

The Care of Your Skin. By Herbert Lawrence, M.D. Boston: Little, Brown & Company, 1955. Cloth. Pp. 95. Price $2.50.

Household Physics. By Madalyn Avery. New York: The Macmillan Company, 1955. Cloth. Pp. 472. Price $5.50.

The Family Circle Fish and Poultry Cook Book. Also Shellfish and Game. New York: The Family Circle, Inc., 1955. Boards. Pp. 144. Price $1.

The Peasant Cookbook. By Marian Tracy. New York: Hanover House, 1955. Cloth. Pp. 224. Price $3.50.

The Complete Book of Home Preserving. By Anne Seranne. Garden City, N. Y.: Doubleday & Company, 1955. Cloth. Pp. 384. Price $5.

Good Health for You, Your Family, and Your Community. By Nelson S. Walke, Ph.D., Nathan Doscher, LL.B., Ph.D., and Glenna Garratt Caddy, M.D. New York: McGraw-Hill Book Company, Inc., 1955. Cloth. Pp. 415. Price $4.75.

Physiology and Anatomy. Seventh Edition. By Esther M. Greisheimer, Ph.D., M.D. Philadelphia: J. B. Lippincott Company, 1955. Cloth. Pp. 868. Price $5.

The Biologic Effects of Tobacco. Edited by Ernest L. Wynder, M.D. Boston: Little, Brown & Company, 1955. Cloth. Pp. 215. Price $4.50.

The Medical Significance of Anxiety. By Richard L. Jenkins, M.D. Washington, D. C.: The Biological Sciences Foundation, Ltd., 1955. Paper. Pp. 46. Price $1.

Tea. Edited by Henry J. Klaunberg, Ph.D. Washington, D. C.: The Biological Sciences Foundation, Ltd., 1955. Paper. Pp. 64. Price $1.

The Effect of Sugar Supplements on Dental Caries in Children. By J. D. King, M. Mellanby, H. H. Stones, and H. N. Green. Medical Research Council Special Report Series No. 288. London: H. M. Stationery Office, 1955. Paper. Pp. 55. Price 4s.

Richtlijnenx Bij de Toepassing van de Dieten. By Zuster Benedicto. Nijmegen, The Netherlands: Uitgeverij de Koepel, 1955. Cloth. Pp. 238.

Teaching Physiology and Anatomy in Nursing. By Hessel H. Flitter and Harold R. Rowe. Philadelphia: J. B. Lippincott Company, 1955. Cloth. Pp. 56. Price $2.

Eat Your Troubles Away. By Lelord Kordel. Cleveland: The World Publishing Co., 1955. Cloth. Pp. 318. Price $3.

Letters to the Editor . . .

Second International Congress of Dietetics

To the Editor:

The announcement in the May Journal of the Second International Congress interested me. The topics listed do not specifically indicate pediatrics, but I feel sure that at some time in the Congress, a discussion on feeding children and understanding the basic needs of children should be presented.

Eva N. Ylvisaker
Head Dietitian
The Children's Hospital
Cincinnati, Ohio

To the Editor:

I would like to find out a little more about the Second International Congress for Dietetics to be held in Rome in September 1956, with the hope of attending. Could you please inform me as to whom I may write for more information and also what qualifications are necessary to attend the Congress.

Dorothy R. Saenger
Richmond Heights, Missouri

Editor's Note: Complete and detailed information about the Second International Congress to be held in Rome next year may be obtained from Dr. Margaret A. Ohlson, Head, Department of Foods and Nutrition, Michigan State University, East Lansing, who is serving as the Chairman of the U. S. phase of planning the program. She was in Rome in August for the purpose of furthering plans for the Congress. Although specific qualifications for attendance at the Congress have not yet been released, members of all participating organizations (including A.D.A.) will certainly be invited, with special arrangements made for admission of others who may not be members of specific organizations but who are working in the field.

Dr. McCollum

To the Editor:

I especially value the Osborne and Mendel Award which I recently received because I formerly worked with both men after receiving my doctorate in synthetic organic chemistry in 1906. Since I did not find a position in organic chemistry, I worked with Professor Mendel for a year. This was of supreme importance, because Professor E. B. Hart wrote Mendel to inquire for a young biochemist who was willing to study animal nutrition in the agricultural experiment station. If I had not been in Mendel's laboratory just at that time (1907), I should never have gone into nutrition, and the entire course of my life would have been different from what it was in nutritional research.

E. V. McCollum
Professor Emeritus, Biochemistry
The Johns Hopkins University
Baltimore, Maryland

Insecticide Contamination of Foods

To the Editor:

Regarding your note in the May issue of the Journal on "DDT in Foods" (page 482), you might be interested to know that the experiment in which men are receiving DDT at the rate of 0.5 gm. per kilogram per day has now continued for more than a year without producing any observable injury to the volunteers. The article, "Present Status of Our Knowledge of DDT Intoxication" by the writer in the April issue of the *American Journal of Public Health* also provides additional information on this subject.

Wayland J. Hayes, Jr., M.D., Ph.D.
Senior Surgeon; Chief,
Toxicology Section
U. S. Public Health Service
Department of Health, Education, and Welfare
Savannah, Georgia

Is "Food Service Administration" a Better Term?

To the Editor:

At Rutgers, we have been working in the areas of curriculum planning and recruitment in a simultaneous effort to encourage more people to enroll in home economics through providing a curriculum that would better fit their needs.

At times we have felt almost handicapped in trying to explain the broad term, "institutional administration," which in itself has little or no meaning. To the new student, it does not sound very exciting to be an institutional manager, and our colleagues ask, "What types of institutions do your graduates manage?"

Our field of food service has developed rapidly since the word "dietitian" was coined in 1899.[1] We now have professionally trained people working in the areas of: school lunch, commercial food service, in-plant feeding operations, college residence halls, and many other types of food service units, as well as hospitals. Bearing this in mind, is it time to rethink the nomenclature applied to these various fields and to have Association action in standardization of terms? Using the old nomenclature, we find that "dietitians" and "institutional managers" employed in the field of "institutional administration."

The writer would like to suggest that the term for the field of work be changed to "food service administration." Then, we would have "dietitians" employed in hospitals and other centers prescribing therapeutic diets and "food service specialists" working in the school lunch programs, commercial enterprises, college residence halls, and so on. This proposed nomenclature, or a similar term, would present a clearer picture in recruitment and, I believe, a more "glamorous" title, i.e., "commercial food service specialist" rather than "institutional manager."

In curriculum planning, too, I believe it would be possible to graduate better prepared students; for example, the school lunch specialist would do well to elect more courses in education, and the commercial food service specialist would benefit from more courses in economics and business administration.

How do you feel about the terminology used in our profession? Are you satisfied?

Jane L. Rees
Department of Home Economics
Douglass College
Rutgers University
New Brunswick, New Jersey

To the Editor:

I believe that Miss Rees' recommendation is an interesting one. I would prefer the new nomenclature which she suggests, namely "food service administration" rather than the old term of "institutional administration." I believe the new suggestion would be a better description of the work done, whereas the old term might cause people to think of a hospital administrator. The use of the new term for people employed as "dietitian" and "food service specialist might also be satisfactory, but will that infer two different backgrounds, i.e., one with specialized dietetic education and experience and the other with general home economics training? On the whole, I believe the suggestion as it concerns curriculum planning is good.

Winifred H. Erickson
Director of Dietetics
Ancker Hospital
St. Paul, Minnesota

Editor's Note: We will welcome other comments on this subject and be glad to continue this discussion in later issues of the Journal.

[1] According to Isabel F. Hamilton, "The word 'dietitian' was first used by a national home economics conference in 1899 to describe 'A person who specializes in the knowledge of food and can meet the demands of the medical profession for diet therapy.'" (*Modern Hospital* 80: 103 [May.] 1953).

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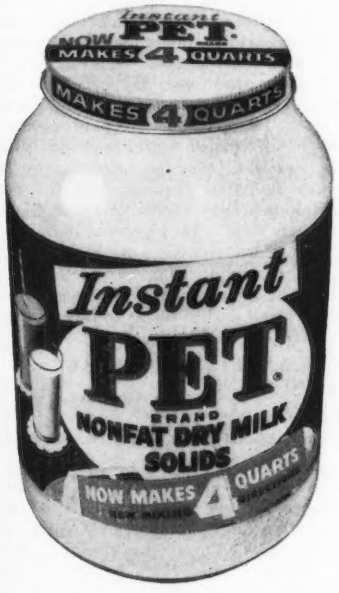

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*Banana Nut Loaf	4
*Biscuits	3
*Biscuit Mix	3
Cinnamon Rolls	9
*Corn Bread	8
Egg Nog	6
Cocoa Mix	5
Hot Cocoa	5
*Old-Fashioned Coffee Cake	1
*Pancakes	2
Yeast Pan Rolls	7
CAKES, COOKIES AND FROSTINGS	
*Banana Nut Bars	12
*Brownies	11
*Chocolate Chip Cookies	14
Chocolate Frosting	16
*Double Fudge Cake	15
*Oatmeal Cookies	18
*Peanut Butter Cookies	13
*Pineapple Upside Down Cake	17
Vanilla Frosting	16

RECIPE	CARD NUMBER
DESSERTS AND SWEET SAUCE	
Apple Crisp	19
Baked Custard	21
Butterscotch Pudding	22
Cranberry Crisp	20
Frozen Lemon Custard	23
*Fudge Cake Pudding	25
Hard Sauce	28
Lemon Sponge Pudding	26
Pineapple Bavarian Cream	24
Raisin Bread Pudding	27
MAIN DISHES	
Barbecued Hamburger Sandwiches	29
Creamed Chicken	31
Creamed Eggs	32
Creamed Tuna and Peas	34
Easy Tuna Bake	33
Hamburgers	30
Juicy Meat Loaf	37
Macaroni and Cheese	35
Meat Balls in Tomato Sauce	39
Salmon Loaf	38
Scalloped Potatoes and Ham	40
Scrambled Eggs	41
White Sauce Mix	42

RECIPE	CARD NUMBER
PIES AND TOPPING	
Coconut Icebox Pie	43
Custard Pie	44
Lemon Chiffon Pie	45
Whipped Topping	46
SALADS, SALAD DRESSING AND VEGETABLES	
Creamed Vegetables	50
Frozen Fruit Salad	47
Hot Potato Salad	51
Mashed Potatoes	48
Potato Pancakes	52
Tomato Salad Dressing	48
SAUCE, SOUPS AND GRAVY	
Cheese Sauce	53
Cream of Potato Soup	55
Cream of Tomato Soup	56
Milk Gravy	54

**Altitude Note: As you know, variations in altitude can affect the success of a recipe in which baking powder is used. Such recipes in this collection (marked with*) have been tested and approved for use in altitudes up to 3,000 feet.*

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Current Literature

Contributed by Mildred Bonnell and administrative dietetic interns, University of Washington, Seattle; Janette C. Carlsen and Ethel M. Miller, The Johns Hopkins Hospital, Baltimore; Elizabeth H. Tuft, Wesley Memorial Hospital, Chicago; and the Journal staff

ACTA SOCIETATIS MEDICORUM UPSALIENSIS

Vol. 60, April 15, 1955

* Antibody formation and nutrition. 2. Antibody titre in lambs and goats fed on homologous and heterologous milk using influenza and diphtheria vaccine as antigens. G. Öberg and O. Mellander.—p. 14.

Antibody Formation and Nutrition. Tests were made on goats fed with cow's milk and goat's milk to determine the animals' capacity of antibody formation. As a result of inoculation with influenza virus, antibody response was better when the feeding was of a homologous type. It was also noted that the weight increase for sucklings and artificially fed animals was nearly the same and that no differences in the general status of the animals were observed. The authors draw the conclusion that differences in nutritive value between two types of very similar foods can exist, which it is not possible to demonstrate when only conventional methods, such as weighing, etc., are used. The differences observed in the influenza series seem to be due to some difference in the composition of the two types of milk. The authors are presently considering the importance of differences in enzymatic hydrolysis between otherwise very similar proteins. In the diphtheria experiments, both groups gave about the same antibody response. The titres, however, showed great variations. It seems of interest to extend these experiments also to other antigens.

AMERICAN JOURNAL OF CLINICAL NUTRITION

Vol. 3, May-June, 1955

* The human requirement for iodine. I. Greenwald.—p. 215.
* The effect of supplements of animal and vegetable protein, vitamin B_{12}, and Aureomycin on hematological values in Central American school children. F. Aguirre and N. S. Scrimshaw.—p. 225.
* Lack of effect of a high fat intake on serum lipid levels. G. V. Mann.—p. 230.

Possible sources of proteins for child feeding in underdeveloped countries. M. Autret and A. G. van Veen.—p. 234.

Human Requirement for Iodine. The literature relating to the iodine requirements of human beings has been reviewed. It would seem that in spite of a large number of clinical and animal investigations, the human requirement for iodine has not been finally established. It appears to be small, less than 100 mcg. per day, and there is no satisfactory evidence that the customary diet, anywhere in the world, does not furnish an adequate amount. The decreases in the incidence of goiter that have followed the introduction of iodized salt have been paralleled or exceeded many times and in many places without any known change in the iodine intake or any reason to believe that there had been any. Even if it be conceded that the use of iodized salt has been responsible for a reduction in the incidence of goiter, one may not regard the amount of iodine so furnished as the requirement.

Blood Values in Central American Children. Vegetable and animal protein lunches, respectively, and a vegetable protein lunch plus 20 mcg. oral vitamin B_{12} daily had no effect on red blood cell count or hemoglobin values of children in an urban school during five months in El Salvador or two years in Guatemala, compared with rural control schools in each country. The daily oral administration of 20 mcg. vitamin B_{12} or 50 mg. Aureomycin to rural Guatemalan children in addition to a vegetable protein lunch, as well as the provision of 50 mg. Aureomycin or 20 mcg. vitamin B_{12} alone, had no significant effect on blood values during a two-year period.

High-Fat Intake and Serum Lipid Levels. Two young men failed to show a significant increase in serum cholesterol or various beta-lipoprotein fractions during fifteen days on a diet of which 57 per cent of the calories came from fat as provided in pemmican. The increase of the proportion of fat calories from about 40 per cent of the total to 57 per cent was the limit of physiologic tolerance of the subjects. Attempts of one subject to consume pemmican solely were repeatedly unsuccessful. These attempts failed because of anorexia and weakness and were associated with ketonuria and dehydration. Thus, there appears to be an upper limit of tolerance of fat in the metabolic mixture supplied by the diet of pemmican, oranges, soda crackers, and milk.

AMERICAN JOURNAL OF DIGESTIVE DISEASES

Vol. 22, June, 1955

* Clinical study on weight reduction in obesity. H. Sapoznik.—p. 159.
* A theory of pathogenesis of duodenal ulcer. O. Porges.—p. 174.

Food fads and faddists. L. A. Bavetta.—p. 178.

Clinical Study on Weight Reduction in Obesity. Weight reduction is relatively easy if a person has the stamina to live on a reducing diet first and then on a restricted diet for a long period of time. However, in most obese persons the will power to reduce food intake is absent or limited. Therefore, in such cases it becomes necessary to strengthen the patient's determination to follow doctor's orders. As long as it is not known how to specifically affect a center in the brain which regulates food intake, we will not be able to treat obesity specifically. In this study a group of private patients were asked to use a 1000-calorie diet containing approximately 100 gm. of carbohydrate, 20 gm. of fat, and 100 gm. of protein. Six different reducing formulas were used in order to induce decreased food intake and to compare the effects and find the most satisfactory one. Benzedrine or Dexedrine, by themselves or in combination with thyroid hormone, produced loss of weight, but also a number of undesirable side effects. The best reducing combination was a preparation (Obolip) which contains only a small dose of d-Amphetamine, a small dose of phenobarbital, lipotropic factors, vitamin B_{12}, and methylcellulose. With the latter compound, a few mild side reactions which disappeared with continued therapy, were noted in two out of fifteen cases. An average weight loss of 3 lb. per week during a six-week period of medication was produced during Obolip therapy.

A Theory of Pathogenesis of Duodenal Ulcer. The regular occurrence of hyperacidity in duodenal ulcer cases is emphasized and the cause of this coincidence discussed. Hyperacidity may be the predecessor and cause of duodenal ulcer. The theory of psychosomatic origin of peptic ulcers is criticized. Hyperacidity may be produced by antrum gastritis. Antrum gastritis may develop through excessive use of seasonings in food. As vigorous individuals lean toward excessive use of spices and vigor of constitution is inherited, the frequent occurrence of duodenal ulcers in certain families seems to be explained.

THE AMERICAN JOURNAL OF NURSING

Vol. 55, July, 1955

* Arteriosclerotic heart disease. B. A. Sachs.—p. 838.

Arteriosclerotic Heart Disease. Atherosclerosis is characterized by specific chemical and physicochemical abnormalities. These abnormalities serve as indices in detecting individuals who may be "atherosclerosis prone," as indices by which the results of treatment may be gauged, and as clues in the constant search for the cause of this illness. The abnormalities indicate that a derangement in lipid metabolism is closely associated with the atherosclerotic state. In some individuals, this is inherited and the incidence of atherosclerotic heart disease in their families is high. In others, obesity, hypertension, diabetes, nephrotic syndrome, xanthomatosis, or hypothyroidism predispose to the early development of atherosclerosis.

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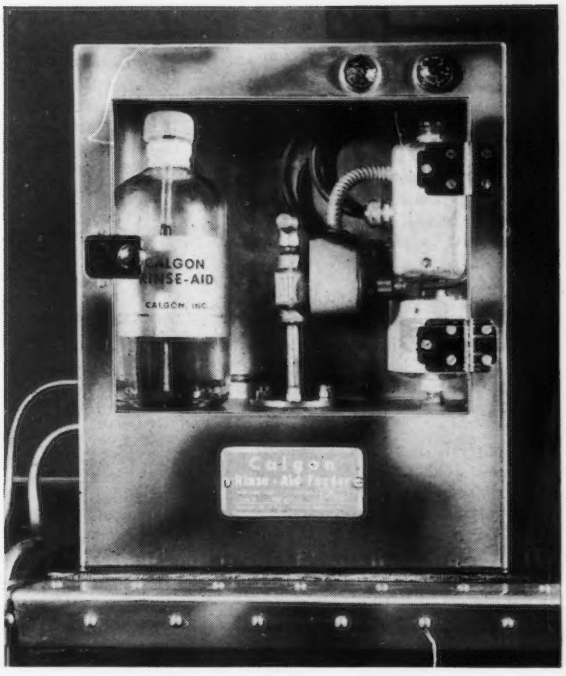

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The underlying disorder should be treated first. Then, a low-fat, low-cholesterol diet, plus one of the newer "decholesterolizing" agents should be prescribed.

AMERICAN JOURNAL OF PUBLIC HEALTH

Vol. 45, June, 1955

* New tools in health education. W. G. Doyle.—p. 746.

Vol. 45, July, 1955

* Institutional feeding—a challenge. M. A. Dunham.—p. 869.

New Tools in Health Education. Suitcase exhibits in health education are useful and interesting at all educational levels. Subject matter should be adapted to existing health curricula, and the exhibit should be easy to carry, unpack, and pack. If the execution of the exhibit combines texture, color, and gadgetry in the right proportions, the result is an attractive, versatile, self-contained teaching tool suitable for use at many grade levels. Although the exhibits described, prepared by the Cleveland Health Museum and the Cleveland Board of Education, developed out of a local demand, they are not confined to a particular school health program. The series can be divided into two groups: those which deal with subjects involving good health habits, such as grooming, nutrition, and posture; and those which are more anatomical and physiological. An exhibit on nutrition makes use of the Basic Seven on a revolving color wheel with a window in it. This exhibit can be successfully used as low as the first grade. The exhibit on teeth has removable panels, photographs, anatomical models of teeth, and a few common dental instruments. The suitcase exhibits extend the use of visual aids by combining them with special and interesting exhibit materials.

Institutional Feeding. Indiana was one of the first states in which the health department recognized the need to provide state-wide dietary consultation to institutions. The scope of activities of the state nutrition consultant is described, starting in 1948 when the position was created. The work so far has been with hospitals, children's institutions, and county homes for the aged. The consultant began by visiting and surveying all hospitals in the state. The results of this survey are enumerated and the procedure followed in giving instruction and consultation service to the various institutions is explained.

AMERICAN JOURNAL OF SURGERY

Vol. 89, June, 1955

* Some problems of peptic ulcer. A. L. Bloomfield.—p. 1109.

Peptic Ulcer. It seems to be part of the tradition of gastroenterology that every up-and-coming specialist should have a diet and a "system" of his own for peptic ulcer. Thus, we have "named" diets without number: the Leube, the Lenhartz, the Coleman, the Smithines, the Sippy, the Meulengracht, and so on. If we search for the common factors in most of these, we find a simple bland diet, eaten slowly and chewed well, served in small portions against a background of rest or relief from strain. How one eats is usually more important than what one eats. Often too little emphasis is placed on eating slowly, chewing well, and not eating when under stress or in a hurry. Fast eating provokes the gastric feeding reflex and may set up indigestion even in a person with a normal stomach. An uncomplicated diet is recommended by the author. With a few days of fasting, symptoms often clear up as if by magic. This is followed first by a regimen of 100 cc. half-and-half which the patient sips every 2 hr. when awake, then by a simple, plainly cooked diet from which are eliminated all coarse and tough foods, all very highly seasoned and spiced foods, and all very greasy foods. When patients are intelligent and cooperative enough to grasp these simple principles, a diet list is often unnecessary.

ANNALS OF INTERNAL MEDICINE

Vol. 42, May, 1955

* Cortisone in the treatment of infectious hepatitis. T. E. Huber and A. T. Wiley.—p. 1011.

Sicklemia. N. Ende, P. Pizzolato, and J. Ziskind.—p. 1065.

Gout becomes of age. Editorial. J. H. Talbott.—p. 1137.

Cortisone in the Treatment of Infectious Hepatitis. Cortisone was used in the treatment of infectious hepatitis in 100 patients. An equal number of patients served as a control group. The results show that the cortisone-treated patients ate more food, with a resultant earlier gain in weight, than the control patients. The patients receiving the cortisone recovered more quickly than those not receiving this therapy.

ARCHIVES OF INTERNAL MEDICINE

Vol. 95, May, 1955

* Metabolic function of the pituitary growth hormone. R. Weil.—p. 739.

Vol. 95, June, 1955

* Newer concepts of experimental obesity. M. B. Fertman.—p. 794.

Treatment of acute renal shutdown. M. B. Strauss and L. G. Raisz.—p. 846.

Metabolic Function of the Pituitary Growth Hormone. The many metabolic changes induced by the growth hormone are traced to three fundamental processes: inhibition of the formation of urea from amino acids, repression of the oxidative break-down of carbohydrate, and acceleration of the mobilization of fat from the depots. Mobilizing labile, stored lipids for various metabolic processes is considered the primary function of adipokinin.

Newer Concepts of Experimental Obesity. Obesity is a severe and often irreversible disease. It is distinct from simple overweight which is reversible and based on a high ratio of caloric intake to rate of growth. The extrinsic causes of obesity include excessive caloric intake, relative inactivity, and possibly nutritional deficiencies and stress situations. The extrinsic factors may activate the intrinsic causes: constitutional, diencephalohypothalmic, endocrine metabolic, and enzymatic. Anywhere along the pathways of the numerous intricate reactions of carbohydrate-fat metabolism, of fat mobilization, and of fat deposition, a disturbance may occur which will lead to obesity. In one form of obesity the pancreas is involved. Experimental results also indicate that the other endocrine glands, the adipose tissue, and the enzyme systems play at least a part-role. That hyperphagia or inability to recognize satiety may lead to obesity is demonstrated by experiments with hypothalmic-induced lesions or stimulation.

BRITISH MEDICAL JOURNAL

No. 4924, May 21, 1955

* Megaloblastic anaemia of pregnancy and the puerperium. J. Badenoch, S. T. Callender, J. R. Evans, A. L. Turnbull, and L. J. Witts.—p. 1245.

No. 4925, May 28, 1955

* The natural history of anaemia associated with protein malnutrition. A. W. Woodruff.—p. 1297.

Megaloblastic Anemia of Pregnancy. Investigation of patients with megaloblastic anemia of pregnancy and the puerperium is handicapped by the urgency with which treatment must be carried out and by the tendency of the anemia to remit spontaneously after delivery. Nine patients with megaloblastic anemia of pregnancy and the puerperium have been studied. The incidence of complications of pregnancy and the puerperium was high. No abnormality in the secretion of intrinsic factor or the absorption of fat was discovered in any case. The serum vitamin B_{12} levels were normal. In women treated before delivery, folic acid was more effective than vitamin B_{12}. Although an absolute deficiency of folic acid cannot be excluded, the anemia seems more likely to be due to resistance to the action of the hemopoietic factors than to deficiency.

Anemia and Malnutrition. Anemia in some African older children, adult males, and non-pregnant females may be associated with chronic protein malnutrition and liver damage, and has the same characteristics, but is more chronic than anemia found in young children and pregnant women. This type of disease is also more common in the tropics than in temperate regions. Growth and development are affected and metabolic and physiologic processes are disturbed in individuals who consistently border on a state of malnutrition. The disease is prevalent in the tropics in the development of gynaecomastia (found in several of the male patients in the series) where liver biopsy showed fatty infiltration or fibrosis. This results from damage which renders the liver incapable of inactivating estrogens normally produced and is probably caused by prolonged protein malnutrition. Some African children may be born with livers already damaged by maternal malnutrition. If they survive, following weaning the demand for protein imposed by growth is greater than the supply,

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and the liver is liable to be damaged further. Then anemia and other signs of malnutrition develop; the majority of those who recover are left with some hepatic damage and fibrosis. A period in which demands for protein are in excess of the available supply in women occurs in acute form during pregnancy, fetal growth being the precipitating factor. In adult males and non-pregnant females the disease develops if the diet markedly and chronically is deficient in protein, and particularly if parasites impose an additional drain of deficient supplies of nutrients.

DIABETES

Vol. 4, March-April, 1955

* Current concepts of body weight and obesity. Editorial. R. Murphy.—p. 154.
* The prevalence of obesity. Editorial.—p. 155.

Current Concepts of Body Weight and Obesity. Several theories concerning body weight and obesity are discussed. The efforts that have been made to measure the absolute quantities of fat in the body are described. As a result of the use of such methods certain significant bits of information have been obtained. Body fat increases with age, even if the body weight remains constant. The failure to recognize this and to decrease the caloric intake with age plays a definite role in the slow, steady increase in weight which is so common with increasing age. Genetic, traumatic, and environmental factors related to the development of obesity are mentioned. The neuropsychiatric and socio-economic aspects are also discussed briefly.

The Prevalence of Obesity. There is little published information regarding the present-day prevalence of overweight. Limited data from four sources regarding the prevalence of overweight in the U.S. are presented in a report of the Public Health Service. These observations made at different times and in different locations indicate that more than 20 per cent of the population of the U.S. are overweight (10 per cent or more above the standard weight for height, age, and build); 6.7 to 12.8 per cent are 20 per cent or more above "desirable" weight. In view of the etiologic relationship of obesity to diabetes, it is evident that a high percentage of the persons susceptible to diabetes because of inheritance, are strongly exposed to a contributory factor which should be subject to correction.

FOOD AND NUTRITION

Vol. 12, January-February, 1955

* The influence of nutritional findings on the utilization of the world's food resources. F. W. Clements.—p. 1.

Nutritional Findings and Utilization of the World's Food Resources. The writer states that the requirements of calories and proteins, at least, for the average adult man and woman are significantly lower than the figures usually quoted in tables of nutrient requirements. Many vegetable proteins and particularly combinations of vegetable proteins provide an adequate supply of amino acids for maintenance. He states that the vegetable oils and most animal fats are of equal value as sources of energy. He points out that the nutritional requirements of adults in countries like Australia could be met by a higher consumption of carbohydrates and a lower consumption of fats and proteins. The nutritional requirement of adults in Asia and perhaps other countries can be met without any increase in the consumption of animal products, merely by insuring an adequate caloric intake. As the socio-economic status rises, there is a tendency for people to consume more expensive diets, richer in proteins and fats of animal origin. This change is determined by other than nutritional factors. That is why we will probably continue to use figures for caloric and protein requirements that are in excess of actual requirements.

FOOD RESEARCH

Vol. 20, May-June, 1955

* Growth, reproduction, survival and histopathology of rats fed beef irradiated with electrons. C. E. Poling, W. D. Warner, F. R. Humburg, E. F. Reber, W. M. Urbain, and E. E. Rice.—p. 193.
* Toxicological determination of suitability of food additives. H. J. Deuel, Jr.—p. 215.

Reduced and total ascorbic acid values of thirty-four foods. K. H. Fisher and M. L. Dodds.—p. 247.

Effect of freezing and freezer storage on cake quality. 1. Baked spice cakes and cakes baked from frozen batters. D. M. Skarha and F. O. Van Duyne.—p. 273.

Effect of freezing and freezer storage on cake quality. 2. Variation in batter treatment before and after freezer storage. D. M. Skarha and F. O. Van Duyne.—p. 282.

Wholesomeness of Irradiated Beef. Raw ground beef was irradiated with 2,000,000 rep of electrons (cathode rays and beta rays) and compared with similar raw ground beef not irradiated, by feeding to albino rats through three generations. About two-thirds of the diet as fed was composed of meat, equivalent to about 45 per cent of the diet solids or 60 per cent of the calories. The animals fed the irradiated beef over a life span (two years) and through successive generations performed very well. Once initial marginal deficiencies of vitamin E (due to destruction during mixing and storage of the diet) were corrected, no major differences existed between the control and experimental groups. No gross or histopathologic lesions attributable to irradiation of the beef were observed. The small and occasionally statistically significant decreases in growth, food efficiency, reproduction, adult body size, and survival were considered to be due to slightly decreased nutritional quality similar to that which occurs during heat sterilization and not an indication of toxic effects. It is concluded that the data provide substantial evidence that treatment of beef muscle with a sterilizing dose of radiation of high velocity electrons does not significantly impair nutritional value or wholesomeness.

Suitability of Food Additives. The question as to what chemicals may be permitted as food additives has assumed increasing importance. The new chemicals employed in increasing the usefulness of foods are not confined to those used in prepared foods. It would also appear that an understanding of the toxicologic action of the various insecticides must necessarily be a present and continuing research problem. Another cause for concern involves the use of hormones in the field of food production. It is still uncertain whether or not the consumption of such food may involve a health hazard. An unofficial group concerned with the safety of chemicals in foods is the Food Protection Committee of the Food and Nutrition Board of the National Research Council. It has attempted to formulate guiding principles and to specify adequate controls to assure the safety of chemicals employed in food technology. The author believes it should be pointed out that the proof of innocuousness may be a long drawn out procedure in cases in which little is known of the metabolic fate of the product under study. However, when the catabolism of the proposed additive can be fitted into already well recognized and well established patterns of biologic reactions, then considerably less information may be required for proving in an unequivocal manner the harmlessness of the product as compared with that which has been considered essential in the past.

FOOD TECHNOLOGY

Vol. 9, June, 1955

* Calcium chloride as a non-enzymic browning retardant for dehydrated white potatoes. M. Simon, J. R. Wagner, V. G. Silveira, and C. E. Hendel.—p. 271.
* The reduction of dehydroascorbic acid by foods upon being heated. E. F. Kohman.—p. 301.
* Acetoglycerides—new fat products of potential value to the food industry. R. O. Feuge.—p. 314.

Vol. 9, July, 1955

* Present needs for special purpose foods in medical diet. T. B. Reynolds.—p. 319.
* The use of monosodium glutamate in frozen pork sausage. J. D. Kemp.—p. 340.
* Effect of certain holding conditions on shelf life of fresh poultry meat. J. V. Spencer and W. J. Stadelman.—p. 358.

Calcium Chloride as a Browning Retardant for Dehydrated Potatoes. It has been shown that calcium chloride treatment of potatoes for dehydration offers a new means for helping to control heat damage during drying, and non-enzymic browning during storage at warm temperatures. Moreover, moderately large quantities of calcium may be employed without impairment of the acceptance of the product. Calcium used in conjunction with sulphite was found to be more effective than either of the two used individually.

The Reduction of Dehydroascorbic Acid by Foods upon Being Heated. It is known that foods generally acquire a higher titration value of ascorbic acid as a result of heat sterilization in canning. The evidence presented bears this out. There is, however, precedent for an argument that the increase merely represents a chemical artifice and that the final conclusion must be based on a biologic demonstration. Appropriate

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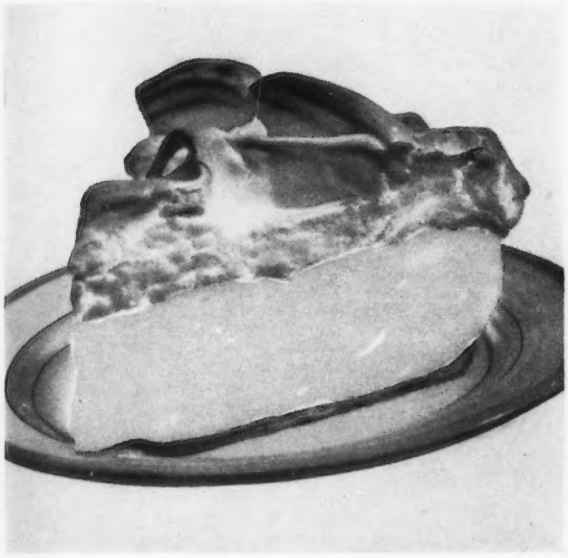

Lemon Meringue Pie

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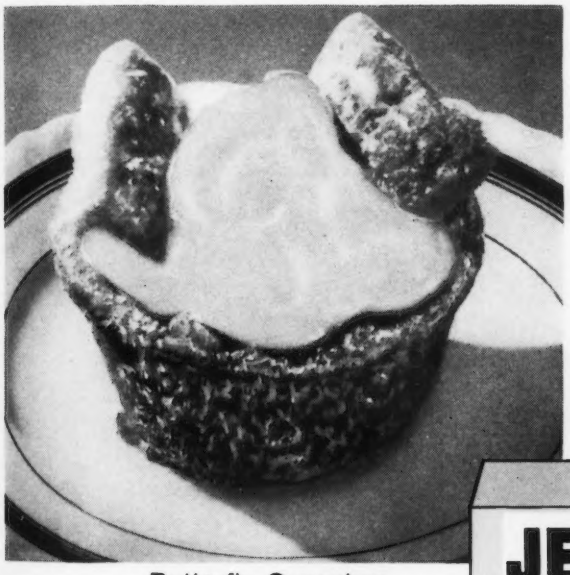

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feeding experiments with guinea pigs have been inaugurated to establish the facts. Upon completion of the experiments, the results will be reported.

Acetoglycerides. The preparation and properties of some unique fat and oil products obtained by substituting, in effect, acetic acid for some of the fatty acids ordinarily combined in fats and oils have been described. By the proper choice of starting materials and degree of acetylation, these new-type fats and oils or acetoglycerides can be tailored within limits to possess specific properties. Insofar as potential food uses are concerned, the acetoglycerides may be divided into three classes: (a) nongreasy, plastic fats of relatively sharp melting points for use as protective coating materials; (b) low-melting oils which possess extraordinary resistance to rancidity; and (c) low-melting oils which possess good resistance to rancidity and remain either liquid or plastic at temperatures far below freezing.

Special Purpose Foods in Medical Diets. Medical diets warrant attention from food technologists only when they are utilized consistently and on a reasonable scale. Three such diets fall in this category—the diabetic diet, the diet for obesity, and the low-sodium diet. The food industry has played a part in making foods more easily available for people on these diets and more will be done in the future. More canned goods are becoming available with composition and calorie labeling. There will be increasing numbers of sucaryl-containing preparations. Of particular value would be a low-calorie substitute for flour. Considering a diet for obesity, it is proposed that the gustatory sense be deceived with palatable but relatively nonmetabolizable low-calorie substances such as calcium cyclamate as a substitute for sugar. Similar types of substitutes would have to be found for such fatty foods as butter, cream, salad dressings, cooking oil. In reference to the low-sodium diet, a step forward would be taken if an acceptable nontoxic substitute for salt could be found. It is felt that one of the biggest contributions the food industry could make at this point is to develop an advertising campaign to make people familiar with the products that are already available.

Monosodium Glutamate in Frozen Pork Sausage. The effect of monosodium glutamate on seasoned and unseasoned frozen pork sausage was studied. Monosodium glutamate increased the desirability of seasoned sausage after four months' storage. Little difference was detected between the unseasoned control and the seasoned and unseasoned sausage when monosodium glutamate was added. There was no advantage to adding 0.3 per cent instead of 0.1 per cent monosodium glutamate.

Shelf-Life of Fresh Poultry. Shelf-life of chicken fryers was studied for birds stored in crushed ice, and birds stored at 38° and 31°F. in mechanical refrigerators. Shelf-life was extended about eight days when birds were stored at 31° as compared with 38°F. On the basis of general appearance scorings, the packaging materials were ranked as follows: (a) polyethylene with absorbent tray; (b) polyethylene bag; (c) cellophane bag stored in crushed ice; (d) cellophane with absorbent tray; and (e) unpackaged, stored in crushed ice.

GASTROENTEROLOGY

Vol. 28, June, 1955

* The effect of cortisone upon absorption of protein, fat, and calcium in idiopathic steatorrhea. I. R. Mackay and W. Volwiler.—p. 972.

Cortisone and Non-Tropical Sprue. The effectiveness of adrenal hormones and ACTH in consistently inducing remissions of idiopathic steatorrhea is well established. Here, a case history of a young woman with severe sprue is described. It illustrates a dramatic clinical response of the condition to such hormone therapy, with a corresponding improvement in fat, nitrogen, and calcium absorption. Calcium balance data suggest that very large doses of oral vitamin D may be ineffective in relapses of sprue and that cortisone may promote calcium absorption independently of the action of vitamin D.

JOURNAL OF AGRICULTURAL AND FOOD CHEMISTRY

Vol. 3, June, 1955

Effect of wave length of light on the discoloration of cured meats. R. F. Kampschmidt.—p. 510.

* Quality of frozen apples related to variety and ripeness. J. S. Caldwell, C. W. Culpepper, and K. D. Demaree.—p. 513.

* Volatile components of vacuum-packed dehydrated pork. M. C. Burnett, C. W. Gehrke, and D. E. Brady.—p. 524.

Variety and Ripeness in Frozen Apples. Sixteen varieties of apples that comprise over 90 per cent of the commercial apple crop of the United States were tested for their relative suitability for freezing and the effect of ripeness on the quality of the frozen product. Fruit harvested at the firm ripe stage of maturity and frozen without further ripening was inferior in flavor to fruit ripened to a good edible stage before freezing. In most cases the use of an anti-oxidant was necessary to prevent excessive browning. Over-ripeness resulted in a soft, mushy texture which calcium chloride treatment did not prevent. In general, Jonathan, Yellow Newtown, Golden Delicious, and York Imperial were considered best for freezing.

Vacuum-Packed Dehydrated Pork. Vacuum-packed, dehydrated pork develops an off-flavor and/or off-odor during storage at elevated temperatures and/or after long periods. Volatile components that develop were found to be basic in nature and to exhibit reducing properties. Aerations of 8-oz. cans of meat showed that the total basicity and reducing power of the volatile fractions increased with a rise in storage temperature. Monocarbonyl compounds were present in benzene extracts of all the meat samples. Acetaldehyde was present in dehydrated pork samples stored at both −20° and 94°F. Ammonia was detected in meat samples stored at 100° and 160°F.

JOURNAL OF THE AMERICAN GERIATRICS SOCIETY

Vol. 3, June, 1955

* Newer clinical and laboratory studies in the aged. VI. Serum lipids, lipoproteins and atherogenic index in "normal" subjects 80-100 years of age. A. A. Goldbloom and H. B. Eiber.—p. 367.

Newer Clinical and Laboratory Studies in the Aged. Lipoprotein fractions (S_F 0-400), distribution curves, and Atherogenic Index have been determined for the first time in "normal" subjects, aged 80 to 100 years. Levels of serum lipids (cholesterol, lipid phosphorus, total lipids, and neutral fats) and phospholipid-to-cholesterol ratios are less at age 80 to 100 than in the middle-age group. Serum total cholesterol and total lipid values are significantly higher in females than in males. The ratio of phospholipids to total cholesterol is statistically unreliable as an aid in biochemical diagnosis of atherosclerosis. In both males and females there is a correlation between the level of total cholesterol and that of S_F 12-20 lipoprotein molecules, but not of other fractions. A low serum level of cholesterol may exist concurrently with a high level of standard lipoprotein fractions. Distribution curves for all classes of lipoprotein molecules are comparable. They show lipoprotein values to be greater in females than in males in the 80 to 100 year group. There seems to be a "threshold" at approximately 65 to 75 years of age, after which there is a decline in the values for total serum lipids, lipoprotein molecules, and atherogenic index. Distribution curves for various groups of lipoprotein molecules may eventually set the diagnostic and treatment pattern for atherosclerosis.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

Vol. 158, June 11, 1955

* Infant feeding and diseases in later life. Foreign Letters: England.—p. 497.

* Caffeine and peptic ulcer. Queries and Minor Notes.—p. 520.

Vol. 158, June 18, 1955

* Calcium and phosphorus intake during pregnancy. Queries and Minor Notes.—p. 21.

Diuretics and weight reduction. Queries and Minor Notes.—p. 22.

Vol. 158, June 25, 1955

Restrictive diets. Correspondence.—p. 689.

* Weight reduction. Queries and Minor Notes.—p. 706.

Vol. 158, July 9, 1955

* Prevalence and significance of anemia as seen in a rural general practice. J. J. Kirschenfeld and H. H. Tew.—p. 807.

Vol. 158, July 16, 1955

* Peptic ulcer in children. Editorials.—p. 927.

Infant Feeding and Diseases in Later Life. It has been suggested that errors in infant feeding might be the cause of disease in later life. It is suspected that when an infant is artificially fed (instead of breast fed) on a "humanized" cow's milk preparation, which may supply only a third as much galactose as human milk, the composition of myelin may be affected. This may cause abnormal cerebrosides to be present in the myelin of the infant, which might affect his subsequent health. Galactose deficiency, with a change in the com-

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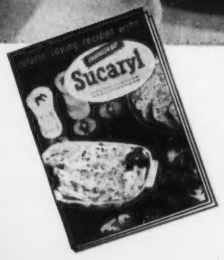

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position of myelin, may play a part in the cause of multiple sclerosis. In communities where breast feeding is usual, multiple sclerosis is rare, and where large quantities of carbohydrate are consumed in infancy, nervous diseases such as transverse myelitis are common. The artificial feeding of infants results in a deficiency of galactose, which may affect the nature, composition, and reaction to stress in later life of the extracellular matrix and connective tissue.

Caffeine and Peptic Ulcer. The question asked is why ingestion of caffeine is forbidden in patients with peptic ulcer. It is stated that many stimulants of the central nervous system cause increase of acidity of gastric secretions and increased motility of the stomach. Caffeine is often ingested by patients several times a day and should not be taken between meals or when the stomach is empty. Other similar stimulants are occasionally prescribed for specific needs but, since used less often, do less harm in the ulcer patient.

Calcium and Phosphorus Intake during Pregnancy. The effect of calcium and phosphorus intake during pregnancy is discussed. It is reported that when obstetric patients were urged to drink more milk or were given dicalcium phosphate, leg cramps were induced, whereas substitution of calcium lactate or calcium gluconate relieved cramps. It was suggested that efficiency of intestinal absorption of phosphates might increase during gestation, with resultant depression of ionized calcium in the blood. To test the hypothesis that predisposition to muscle tetany during the latter half of pregnancy is due to disturbed electrolyte ratios, three forms of theoretically indicated therapy were tried. All three methods of treatment, as against no treatment, yielded statistically significant results.

Diuretics and Weight Reduction. The use of any mercurial diuretic, or any other diuretic medication, in a case of plain obesity has no justification. Whatever diuresis results is immediately counterbalanced by retention of ingested fluids in order to restore normal balance. A degree of weight loss by dehydration can result from rigid restriction of sodium in all forms. Aside from the failure to produce the desired results, use of a mercurial diuretic in moderate or discrete amounts in the absence of edema is unlikely to result in unfavorable side effects.

Restrictive Diets. The writer takes exception to an editorial which recently appeared in the J.A.M.A. which stated that too much emphasis was being placed on restrictive diets. He believes that a great deal of benefit is derived from restrictive diets. He says that the editorial disagrees with the majority opinion of physicians today, who do restrict salt in treatment of hypertension. He also states that it is dangerous to suggest that laxity is possible in a diabetic diet.

Weight Reduction. A quotation is given from *Nutrition and Diet in Health and Disease*, (McLester and Darby, 6th ed., Philadelphia, W. B. Saunders Company, 1952) as follows: "Any effect of fluid restriction or low-salt regimens on weight reduction of the obese patient is due entirely to the influence of such regimens on water loss. They do not promote the burning of the excessive tissue fat, and accordingly are not effective in the treatment of obesity. Obviously, if the fluid restricted by such a regimen is a potent source of calories (such as beer or carbonated soft drinks), the restriction will improve the effectiveness of a low-calorie schedule! Otherwise it is quite without value."

Prevalence and Significance of Anemia in a Rural General Practice. The incidence of anemia in patients presenting themselves to the family physician in a rural area in Alabama appears to be lower than expected in this study. The incidence of anemia was about 10 to 15 per cent in the white patient population and 20 to 25 per cent in the Negro patient population. The chief causes of anemia in this group of patients were poor diet, pregnancy, excessive blood loss, inhibition of hematopoiesis by disease, or a combination of any of the above. Sixty-one per cent of the anemias were of the iron deficiency variety; 39 per cent were of the normochromic, normocytic type. Anemia in the female is not as significant as it is in the male. In the former it is usually due to menorrhagia, pregnancy, or deficient diet. In the male it is almost pathognomonic of a disease process. This is especially true of the white male. The majority of patients with anemia, in this study, responded well to improved diet (high in protein), prescription of an iron salt (ferrous sulphate), and eradication of infection or source of excessive blood loss, whichever was operative.

Peptic Ulcer in Children. Peptic ulcer in children, while uncommon, does exist, possibly more widely than hitherto suspected. Presumably, the small number of cases that have been reported is more a matter of failure to recognize the existence of the disease than of the condition's actual absence. In either event, it is pointed out that when abdominal pain, nausea, vomiting, and anorexia take place in older children, and when the "feeding problem" group of symptoms ensue in infants and younger children, physicians should consider peptic ulcer in the differential diagnosis, with efforts directed toward proving or disproving this possibility.

THE JOURNAL OF BIOLOGICAL CHEMISTRY

Vol. 214, June, 1955

Reversal of alcohol toxicity by glutamine. J. M. Ravel, B. Feising, E. M. Lansford, Jr., R. H. Trubey, and W. Shive.—p. 497.

Voluntary alcohol consumption by rats following administration of glutamine. L. L. Rogers, R. B. Pelton, and R. J. Williams.—p. 503.

* The amino acid requirements of man. 10. The lysine requirement. W. C. Rose, A. Borman, M. J. Coon, and G. F. Lambert.—p. 579.

* Compounds other than threonine that affect fat deposition in the livers of rats fed low protein diets. D. A. Benton, A. E. Harper, M. E. Winje, and C. A. Elvehjem.—p. 677.

* Metabolism of D-tryptophan in the normal human subject. R. R. Langner and C. P. Berg.—p. 699.

The Lysine Requirement of Man. Six experiments were conducted on normal young men for the purpose of establishing their minimal L-lysine requirements, as measured by the nitrogen balance technique. The results show that the subjects required from 0.4 to 0.8 gm. of this amino acid per day. No correlation was observed between the minimal needs of the subjects and their body weights, body surfaces, or creatinine output. In accordance with the practice followed in similar investigations involving other amino acids, it is proposed, as a precautionary measure, that the highest observed value, or 0.8 gm., be designated tentatively as the minimal daily L-lysine requirement of man. In formulating human diets designed to avoid amino acid deficiencies, allowance should be made for the possibility that individuals other than those tested may require still larger intakes of L-lysine. Therefore, twice the highest-observed minimum, or 1.6 gm. daily, is certainly a safe intake. Eventually, experience may permit this quantity to be lowered. In two subjects, the administration of D-lysine, in amounts equal to or greater than their L-lysine requirements, immediately induced negative nitrogen balances. The findings demonstrate that little, if any, of the D isomer is utilized by man. No evidence was obtained in support of the alleged increase in output of organic acids following the exclusion of lysine from the food.

Deposition of Liver Fat. The effects of various supplements on the deposition of liver fat in rats fed a low-protein diet containing choline and methionine were studied. Leucine, glutamic acid, aspartic acid, and benzoic acid were found to be effective in preventing excessive deposition of liver fat. Supplements of glycine, serine, and glutamic acid, equivalent to 1.5 per cent glycine on a molar basis, caused reductions in the level of liver fat which were of similar magnitude, while choline fed at a similar level was more effective. Dietary supplements of 1.5 per cent of glycine and 3.0 per cent of glutamic acid produced their maximal reduction of liver fat in two days, while the effect of 0.36 per cent of DL-threonine did not appear to be complete even after six days. The effect of threonine on fat deposition in the liver was thus considered to be different from that of the other two compounds; possible explanations for these differences are discussed.

Metabolism of *D* - Tryptophan. Analyses by paper chromatography of urines voided by the normal human subject after the ingestion of D-tryptophan have shown that a considerable portion of the tryptophan is excreted, together with appreciable amounts of D-kynurenine and traces of indolepyruvic acid and acetyltryptophan. Quantitative analyses by four different methods confirm the excretion of a large portion of the D-tryptophan ingested by the normal human subject as such or as a component of DL-tryptophan. The output in the urine is adequate to account alone for the reddish purple precipitate formed upon the addition of

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iodine. Quantitative estimates of the kynurenine excretion were also made, but the output of indolepyruvic acid and acetyltryptophan was not assayed quantitatively.

THE JOURNAL OF THE CANADIAN DIETETIC ASSOCIATION

Vol. 17, June, 1955

* Nutritional needs of the aged. E. Feniak.—p. 26.

Nutritional Needs of the Aged. The increased population in the upper age levels is leading to increased attention to the problems of geriatrics. The problem of feeding cannot be overlooked, because of the situation wherein far too many senior citizens are undernourished, either from insufficient food or poor selection of food. However, there are difficulties in research in geriatric nutrition, mainly because of the influence of previous nutritional history of subjects, and the effect of sixty or seventy years of food intake on body tissues and metabolic processes makes conclusions difficult. Senility starts at no particular age, but is determined by physiologic factors. Proper nutrition can greatly influence physiologic health. Experiments with rats have shown that good nutrition promotes longevity. Although vitamin needs of the aged are high, economic reasons, lack of teeth, or poor food habits may make adequate intake difficult. Curtailment in the total amount of calories with constant reduction in the total amount of food consumed is recommended because of decreased activity. Since the vitamin and mineral content of the food must be raised, and the caloric content lowered, the main problem in good nutrition of the aged stems from food choice.

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JOURNAL OF CLINICAL INVESTIGATION

Vol. 34, June, 1955

* The effect of the supine position on renal function in the near-term pregnant woman. J. A. Pritchard, A. C. Barnes, and R. H. Bright.—p. 777.
* The isolation and electrophoretic characterization of the proteins in the urine of normal subjects. E. McGarry. A. H. Sehon, and B. Rose.—p. 832.
* Changes in free amino acids in the plasma during hepatic coma. C. Wu, J. L. Bollman, and H. R. Butt.—p. 845.

Renal Function in Supine Pregnant Women. Shifting near-term patients from lying on their sides to lying on their backs resulted in a considerable decrease in the rate of excretion of water and sodium. The excretion of potassium and effective renal plasma flow and glomerular filtration rates usually were not as markedly affected. The renal response to the supine position was not peculiar to pregnancy for similar changes were observed in women with large abdominal neoplasma, pelvic in origin. The mechanism by which these changes were produced remains somewhat obscure but appears to involve venous compression rather than ureteral obstruction. It is hoped that by these studies it will be possible to account for the occasional absence of reduction in water and sodium excretion in near-term pregnant women in the supine position, for it is conceivable that the degree of venous compression by the uterus and its contents may vary not only from subject to subject but also may vary in the same subject at different times depending on the anatomical relationship of the fetus and uterus to the venous return system.

Electrophoretic Studies of Urine Proteins. Methods for concentrating proteins from dilute solutions are described and their limitations are discussed. Alcohol precipitation was found to give the best recoveries and the most consistent results. The proteins in the urine of normal subjects, isolated by the alcohol precipitation method, were characterized by free electrophoresis. Protein components were found in urine having mobilities of the same order of magnitude as albumin and globulins of serum. The preponderant globulins of urine were those having an electrophoretic mobility similar to that of alpha globulins of serum. Globulin components showed marked heterogeneity. The A/G ratio was found to be 0.65. An unidentified moiety with a mobility greater than that of albumin was found to be present in urine. The average protein output in the urine of normal individuals would appear to be at least 71 mg. a day, a figure somewhere higher than previously reported. Experiments with I^{131} tagged human serum albumin in two normal subjects showed that serum albumin is excreted in the urine of normal individuals. Some experiments

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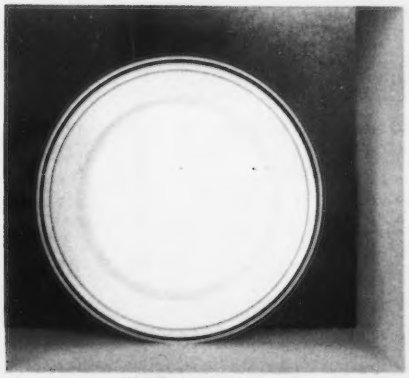

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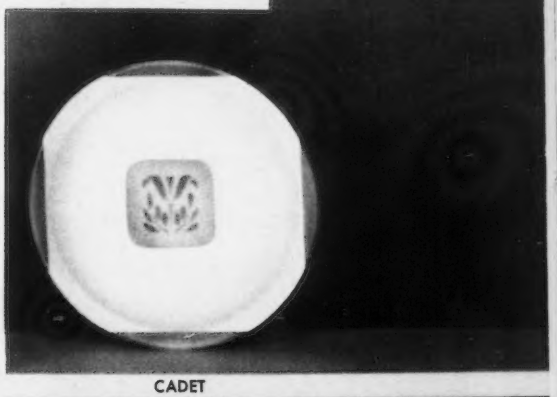

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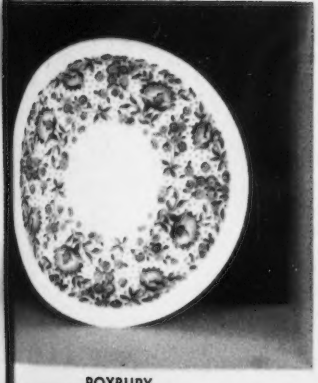

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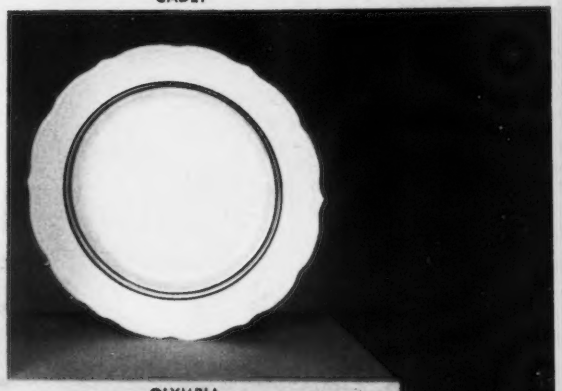

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using paper electrophoresis demonstrated that this method may be applied to the study of the electrophoretic pattern of proteins in relatively small aliquots of normal urine.

Changes in Free Amino Acids during Hepatic Coma. Of twelve patients observed clinically, four were in precoma, one in light coma, and seven in deep coma. Free alanine, cystine, glutamic acid, glutamine, glycine, methionine, serine, taurine, and tyrosine in the plasma were determined by paper chromatography. Glutamic acid, glutamine, and tyrosine were increased in nine patients; cystine was increased in eight patients, and methionine was increased in seven patients. On the other hand, glycine was increased in only two patients. Methionine appeared to increase oftener among those in precoma. However, consistent changes in the content of amino acids in the plasma were not observed. The presence of increased amounts of methionine, glutamic acid, and other amino acids in the plasma of patients in hepatic coma makes it appear unlikely that further additions of these substances would promote recovery from this condition.

JOURNAL OF HOME ECONOMICS

Vol. 47, June, 1955

* Meat cookery as a matter of facts. R. Staggs.—p. 397.

Meat Cookery. Years of experimentation and practical experience are behind the methods of meat cookery. Some methods have been modified because of the changes in meat animals, new processing methods, and the marketing of new equipment. Handling and storage of meat is important to get best results. Fresh meat should be uncovered or loosely covered in the coldest part of the refrigerator. Frozen meat should be carefully wrapped to exclude all air and stored at 0°F. or lower. Cured and smoked meats should be stored in the refrigerator in the packages in which they are purchased, and cooked meat should be covered and stored in the refrigerator in as large pieces as possible. Choosing a cookery method depends on: (a) tenderness of cut, (b) size and thickness, (c) available cooking facilities, and (d) degree of doneness desired. However, all meat should be cooked at low temperature, which means less watching during cooking, more uniformly cooked meat, and more meat to serve, as well as meat that is juicier, more tender, and more attractive. This article gives proper cooking methods for all types of meats and includes methods of defrosting and cooking frozen meats.

THE JOURNAL OF PEDIATRICS

Vol. 46, June, 1955

* The use of partial vitamin supplements in the treatment of growth failure in children. J. Crump and R. Tully.—p. 671.

Vitamins for Growth Failure. Vitamin B_{12} (25 mcg.) and thiamine (10 mg.) were administered daily to fifty children with a clinical diagnosis of malnutrition and anorexia due to chronic illness. By clinical impression, responses in these children seemed to indicate a general improvement in appetite coupled with increased weight and height increments. Analysis by Wetzel Grid charts prepared for thirty-two of these patients revealed positive channels and auxodrome shifts in sixteen of eighteen children whose charts indicated a simple growth failure, but no appreciable response in fourteen children whose charts did not. The improvement in monthly developmental levels was shown to be statistically significant with a probability of error less than 0.01. The inability to discriminate between actual and apparent growth failure by clinical impression emphasizes the need for objective standards in appraising response to nutritional supplements.

THE LANCET

No. 6873, May 21, 1955

* Better nutrition.—p. 1061.

Better Nutrition. This article discusses the recent report of the joint WHO/FAO committee on nutrition. Although protein malnutrition is now recognized as a serious cause of ill health among women and children in most tropical and subtropical countries, the amount of protein necessary for good health in various circumstances is still a matter on which opinions differ and evidence is insufficient. Further investigation is needed on the develop-

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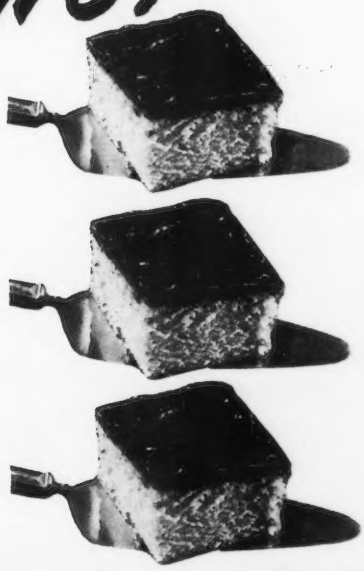

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ment of protein-rich foods for the supplementary feeding of breast-fed infants and for weaned infants in parts of the world where at present human milk is the only suitable form of protein the child can get. Besides additions to diets, there is also the question of additions to foods; for example, the proposals to add vitamin A to skim milk and to add potassium iodate (which is less liable to loss than the iodide) to the salt consumed by the inhabitants of goitrous areas. Beri-beri and scurvy have been degraded from major menaces to preventable nuisances, and it has become plain that there are many foods with properties besides the absence of vitamins which are capable of contributing to ill health. An instance of this is maize and its relation to pellagra. Although education is one of the most important instruments of nutritional work, it is one of the hardest to use properly. It is vital that the instruction given by doctors and nurses relate to the actual dietary habits of the country in which they are applied, and not simply to those of the countries which produce most of the textbooks.

THE NEW YORK STATE JOURNAL OF MEDICINE

Vol. 55, June 15, 1955

* Proprietary nursing and convalescent homes. Their role in providing care for the chronically ill. I. J. Brightman, E. C. Lyons, and E. R. Gramm.—p. 1713.

Proprietary Nursing and Convalescent Homes. This study was conducted on a 10 per cent sample of nursing homes and 25 per cent sample of convalescent homes in New York State. Twenty-two per cent of the nursing home patients and 7.6 per cent of the convalescent home patients received special diets. The most common dietary request by physicians was for salt-free or low-salt diets with diabetic diets in second place. The number of available beds in nursing and convalescent homes has increased considerably during recent years, and these facilities have developed an important role in the care of the elderly and chronically ill who do not require hospital service but who cannot be cared for at home. About one-fourth of the patients have been in the homes for three years or more, and another one-third have been there between one and three years. Medical care seemed adequate in most instances with the majority of patients being under the regular care of their own physicians. However, 11 per cent of the nursing home patients had not been seen by a physician for periods of three months or longer. Nursing services appeared adequate. If nursing and convalescent homes are to maintain the important role they have been assuming in the care of the elderly and chronically ill, there should be immediate steps taken to provide more dynamic social and recreational programs for the long-term and mentally clear patients and more intensive social and rehabilitative planning on the part of the physicians and social workers concerned with the individual patients.

NUTRITION

Vol. 9, Summer, 1955

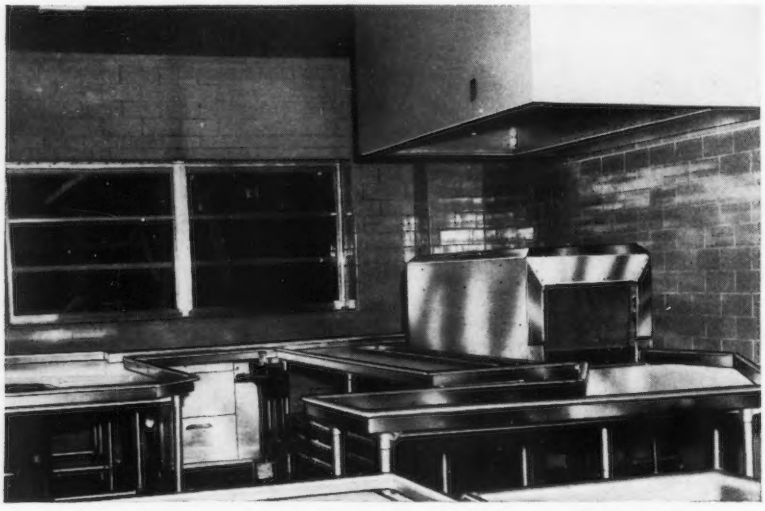
* What is the right weight? D. A. W. Edwards.—p. 55.

* Food hygiene. T. M. Parry.—p. 60.

* Nutrition and dietetics in Milan. J. Whiteman.—p. 77.

What Is the Right Weight? Following a discussion of cultural and nutritional backgrounds as determinants of weight, the author reviews the physiologic and pathologic criteria of overweight. He concludes that what matters in terms of health, and possibly beauty, is the ratio of fat mass to lean mass (the thickness of the fat layer under the skin). He suggests further that the average thickness of fat be taken for the best average weight. In a woman, the spare tire between umbilicus and pubis should be no thicker than your thumb; in a man, it should be no thicker than your little finger, the measurement to be made by squeezing the tire with the forefinger and thumb.

Food Hygiene. In the British Isles there were 51,231,364 food hygiene problems according to the Registrar General's latest census return. Although such a figure may be misleading and give an unsatisfactory picture, it is necessary to give positive guidance to the people who need to be influenced. The background for the present organizations or health service in England is presented.



Model R-4 in main dishwashing room. Other Colt Autosans in main cafeteria, tea room, and Sisters' Dining Room. All kitchen equipment installed by Krebs Bros. Supply Co., Inc., Little Rock.

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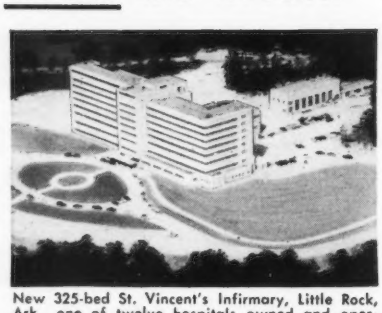

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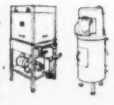

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NUTRITION EDUCATION, as important as it is, perforce is slow in effecting public health gains; practical measures on a national scale, on the other hand, can effect such gains quickly.[1] An outstanding example of practical measures for helping to overcome malnutrition has been the broad commercial enrichment of white bread initiated in 1941.

By enrichment according to official regulations, white bread became an important food for supplying thiamine, riboflavin, niacin, and iron to the national dietary.[2] Supplementing enrichment in these nutrients, nonfat milk solids are added in amounts averaging 4 per cent (by weight) of the flour component.[3] Such enriched bread is valuable not only for its contained B vitamins and iron, but for its calcium[4] and its good quality protein[5] as well.

Mortality and morbidity of nutritional deficiency diseases have dropped markedly since the advent of commercial enriched bread. No stronger evidence can be cited than the virtual elimination of pellagra in our population in recent years.[1] In 1937, pellagra mortality was 2.5 per 100,000. By 1951 it had dropped to 0.1, representing an unprecedented low of 208 deaths reported in the entire country.

But a fall in mortality data reflects only in small measure the true improvement in public health resulting from the nutritional betterment of the national dietary.[1] Of greater concern is the vast number of people who, as a result, enjoy better health with increased capacity to work and enjoy life.

1. Sebrell, W. H.: Developing Modern Nutrition Programs, Public Health Reports, United States Department of Health, Education, and Welfare *69*:277 (Mar.) 1954.
2. Jolliffe, N.: The Pathogenesis of Deficiency Disease, in Jolliffe, N.; Tisdall, F. F., and Cannon, P. R.: Clinical Nutrition, New York, Paul B. Hoeber, Inc., 1950, p. 22.
3. Cook, H. L., and Halvorson, H.: Industrial Uses and Preferences for Nonfat Dry Milk Solids, Wisconsin Agricultural Experiment Station and United States Department of Agriculture, Research Bull. 169, 1950.
4. Goddard, V. R., and Marshall, M. W.: The Calcium Content of Commercial White Bread, United States Department of Agriculture, Technical Bull. 1055, 1952.
5. Sherman, H. C.: Chemistry of Food and Nutrition, ed. 8, New York, The Macmillan Co., 1952, pp. 212, 599.

The nutritional statements made in this advertisement have been reviewed and found consistent with current medical opinion by the Council on Foods and Nutrition of the American Medical Association.

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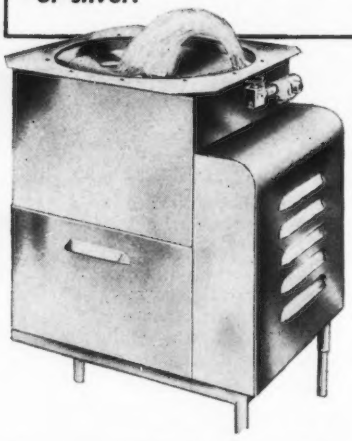

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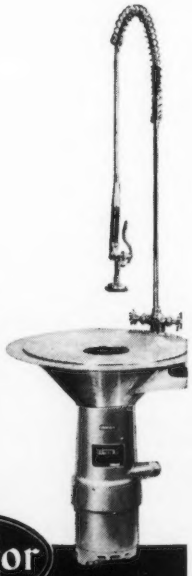

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The Food and Drugs Act of 1938 was a bit antiquated when it became law, and unfortunately, it came at a time when the more pressing business of the defense of the country was uppermost. In 1946 the Ministry of Food developed model by-laws and invited local authorities to adopt them. They covered almost every possible aspect of the clean handling, wrapping, and delivery of food and the sale of food in the open air, and are now operative in more than 92 per cent of all local authority areas in England and Wales. New national laws and regulations are still in the process of preparation. Important too, is the job of interesting everyone in food hygiene, particularly equipment manufacturers. Intelligent use of detergents, disinfectants, and deodorants is also needed.

Nutrition and Dietetics in Milan. The two schools for dietitians in Milan and Rome, Italy, are directed by Dr. Edwige Filleti. Her work involves training dietitians (all nurses) for hospital work, and teaching fourteen-day courses in large towns in northern Italy for administrators and other workers concerned with institutional feeding. Also described are a factory health and welfare program, a school lunch program, and a feeding program for summer camps.

NUTRITION ABSTRACTS AND REVIEWS

Vol. 25, April, 1955

* The physiological effects of lactose. D. L. Duncan.—p. 309.

The Physiologic Effects of Lactose. Lactose has physiologic effects not characteristic of other sugars; some are due to galactose liberated when lactose is hydrolyzed, others are specific to the lactose molecule. Lactose in the diet, in the presence of ample calcium, maintains normal serum calcium and prevents tetany after parathyroid removal. It increases retention of dietary calcium, apparently by improving the utilization of calcium already absorbed, and increases the mineral content of the bones. It prevents loss of minerals from the skeleton of lactating rats. A possible role in the treatment of milk fever is discussed. As the natural sugar occurring in breast milk, lactose appears to have special value in infant feeding. It helps to maintain the natural intestinal flora seen in the breast-fed infant, and produces healthy, firm-fleshed babies with few gastrointestinal upsets. When it is hydrolyzed it provides the energy-producing sugar glucose and the "structural" sugar galactose, which may be important in the formation of such compounds as cerebrosides and mucopolysaccharides. Excess of lactose in animal experiments produces diarrhea and undernutrition. Large amounts of galactose are poorly utilized by animals and lead to the formation of cataracts. There is some evidence that galactose may interfere with the mechanisms for carbohydrate breakdown. Fat and large amounts of B vitamins can counteract the effects of an excessive lactose.

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Ash	2.77%
Protein Nx 6.25	13.90%
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Caloric Value per slice	17
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2 slices to package . . . 180 packages per caddy

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NUTRITION REVIEWS

Vol. 13, June, 1955

* Protein quality. O. Mellander.—p. 161.
* Utilization of iron compounds in enriched bread.—p. 165.
* The effect of eating upon vitamin A absorption.—p. 167.

Vol. 13, July, 1955

* Nutritive effect of foods sterilized by ionizing radiations. H. F. Kraybill.—p. 193.
* Milk alkali disease.—p. 199.
Metabolism following burns.—p. 202.
Nutrition and health of an aged population.—p. 204.

Protein Quality. The working hypothesis of the author is that proteins are utilized partly as large peptides. Experimental evidence is given for the formation of such peptides, when certain milk proteins are enzymatically digested. It is probable that certain mixtures of proteins are less completely hydrolyzed than pure proteins. Large peptides as such may be of nutritional importance, because of the time factor in protein utilization and because they may combine with other nutrients, for example calcium and iron, and favor their absorption. In the evaluation of vegetable protein combinations of high nutritional value to use as substitutes for animal protein, it is possible that not only the amino acid content has to be taken into consideration, but also the type of peptides formed physiologically. It is possible that the larger the peptides of a certain protein which an organism is able to utilize, the better the nutritional quality of the protein.

Utilization of Iron Compounds in Enriched Bread. Results of experiments seem to prove that reduced iron, ferric orthophosphate, and sodium ferric pyrophosphate may be added to bread enrichment mixtures with full confidence that these compounds are as readily available and as fully utilized as is ferrous sulphate. Another interesting finding showed that ingestion of 1 gm. ascorbic acid immediately after eating the bread containing labeled ferrous sulphate, ferric orthophosphate, and sodium ferric pyrophosphate produced a markedly enhanced absorption and utilization of iron. Although this effect might be presumed to be due to the reducing action of ascorbic acid, it increased the absorption of iron from breads containing ferrous sulphate and reduced iron just as much as it did that to which ferric salts had been added.

The Effect of Eating upon Vitamin A Absorption. A test is described which should help to explain the discrepancies in vitamin A absorption previously recorded and to standardize a vitamin A absorption test. Vitamin A palmitite dissolved in corn oil was administered orally to a group of subjects. It was found that the vitamin A was poorly absorbed, or was absorbed but lay in the lacteals when given during fasting. However, the blood concentration of vitamin A rose dramatically after a meal or after a sham feeding.

Radiation Sterilization of Foods. While thermal treatment and freezing of foods are widely accepted methods of food preservation, they have certain disadvantages. With frozen foods, refrigera-

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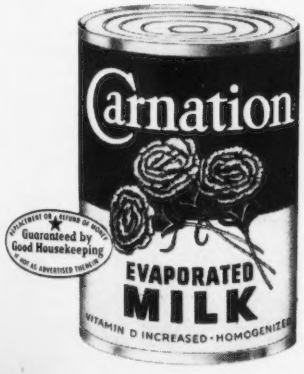

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- ⅔ cup (small can) undiluted CARNATION EVAPORATED MILK
- 1 egg
- 1½ pounds ground chuck
- ½ cup cracker crumbs
- 1½ teaspoons salt
- ¼ teaspoon pepper
- 1 teaspoon dry mustard
- ¼ cup grated onion
- ½ cup chopped green pepper

Blend all meat loaf ingredients together until thoroughly mixed. Place in paper-lined loaf pan (8″x 4″x 2″). Bake in moderate oven (350°F.) 50-60 minutes. Allow to stand about 10 minutes. Turn out on platter, remove paper and slice for serving.

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tion space and cost can be drawbacks in military operations. Then there are a number of canned items such as meat products which require excessive amounts of heat energy for sterilization and consequently do not result in the best flavor and texture. Both of these problems could be eliminated with the development and utilization of radiation sterilization. One of the factors involved in finding a suitable technique for radiation sterilization of foods is the selection of the type of radiation. These types and their effects on food are reviewed.

Milk-Alkali Syndrome. Recent investigations have pointed up the need to control carefully the treatment of peptic ulcer in order to prevent occurrence of the milk-alkali syndrome. This syndrome is characterized by increased concentration of serum calcium, deposits of calcium in the membranes of the eye and in other tissues, and kidney damage. It would be unfortunate to impugn a valuable and good food, milk, because of the occasional occurrence of this disorder. However, it would be of the greatest importance to restrict the use of alkaline powders. Preparations are available which afford almost as prompt and complete relief from the distress of peptic ulcer without the hazard of inducing the milk-alkali syndrome. These are the nonabsorbable alkalis, examples of which are aluminum hydroxide and magnesium trisilicate.

PUBLIC HEALTH REPORTS

Vol. 70, June, 1955

* Nutrition at the shopping center. W. H. Sebrell, Jr.—p. 561.
* Self purification of the soft clam, Mya arenaria. W. Arcisz and C. B. Kelly.—p. 605.

Nutrition at the Shopping Center. The nutritional quality of diets in this country has improved steadily since World War II. Yet there are further opportunities ahead. We do not have widespread serious deficiency disease any more—but this is no reason to be complacent. Let's look for a moment at a form of malnutrition that affects at least a quarter of our population. This is obesity. Health officers and physicians are waging a ceaseless war against this condition. Sellers of food, too, have a very real interest in this form of malnutrition as well as all other forms—not only a humanitarian interest, but a business interest. The fat man is fat because he eats too much; the remedy is to get him to reduce his caloric intake until he uses up his own excess fat. Is it better business to sell him 3500 calories as 2 lb. sugar or to reduce his calories to 2700 by selling him 2 lb. sirloin steak? One of the greatest needs today is better nutritional education. Nutritional education is the essential link between professional knowledge and the improvement of food practices. It seeks to establish public understanding of, and demand for, a food supply adequate for optimum health—a balanced consumption of nutrients—taking into account a wide range of incomes. The physician, the nutritionist, the health officer, the scientist, and the teacher are struggling with limited resources and limited opportunity to teach good nutrition to the individual. The housewife learns from these sources that good nutrition can help make her pregnancy successful, her baby healthy, and its growth good—that health, vitality, and long life are not attainable without good nutrition. It is usually her responsibility to buy the food for her family. And where does she make this final day-to-day decision? Frequently in the food store and the market. And what guidance does she get at the point of sale to help make her purchases fit with what she has been taught? None. We will never have a really successful program until the food sellers and the food industries cooperate with the scientists, nutritionists, and teachers in developing a positive, aggressive, coordinated program to present basic nutritional facts clearly and simply to the American homemaker, so that she can use those facts at the point of sale for the best nutrition for her family.

Self-Purification of the Soft Clam, Mya Arenaria. Polluted clams can be purified by exposure to running sea water of low coliform content, according to the experiments described. Activity of the clam may play a part in the length of time required for purification. However, even the least active animals studied showed significant decreases in bacterial loads within the purification time employed in the usual clam treatment processes. The clam is able to function and purify itself at water temperatures of 2.5°C. (34.5°F.) to 20°C. (68°F.). The recommended coliform MPN of 2,400 per 100 ml. for cleansed clams can usually be attained in 24 hr. or less. It has not been determined whether the few *Salmonella schottmuelleri* irregularly observed after 24 hr. purification were derived from organisms in the experimental apparatus and water or from those retained in the animal bodies. Purification time was not materially influenced by the initial pollution loads in the clams used in these studies.

SCIENCE

Vol. 121, June 17, 1955

* Role of histamine in poisoning with spoiled fish. E. Geiger.—p. 865.

Vol. 121, June 24, 1955

* Effect of feeding dogs the flesh of lethally irradiated cows and sheep. R. H. Wasserman and B. F. Trum.—p. 894.

Role of Histamine in Poisoning with Spoiled Fish. The experiments presented do not support the contention that histamine present in spoiled fish is the cause of fish poisoning. Instead, they indicate that other toxins produced by certain toxin-forming microorganisms in the course of spoilage may be mainly responsible for toxic symptoms. The possibility that histamine may participate in cases of human fish poisoning cannot be entirely eliminated, because highly seasoned hot dishes prepared from spoiled fish, or simultaneous consumption of alcoholic beverages, may possibly facilitate the intestinal passage of histamine.

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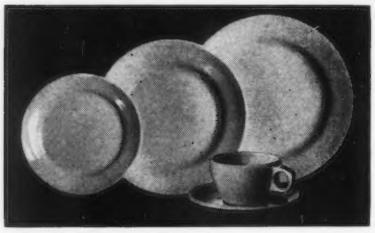

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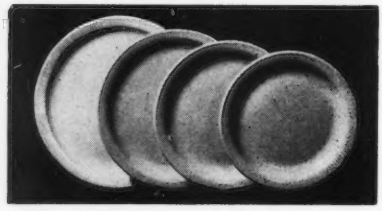

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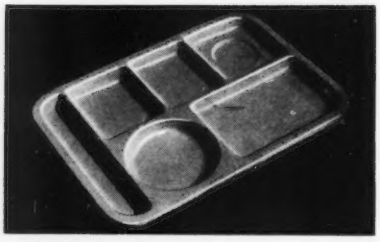

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Effect of Feeding Dogs the Flesh of Lethally Irradiated Cows and Sheep. There have been no reports of studies concerning the possible toxicity of the ingested flesh of animals receiving lethal doses of gamma radiation. Based on biophysical conceptions of the interaction of radiation and matter, it was the consensus that the flesh of these animals would not prove harmful if it were consumed. It has been shown that sterilization by high levels of irradiation does not import toxic properties to foods. This would indicate that, if deleterious compounds occurred in the flesh of irradiated animals, they would be the result of the effects of ionizing radiation on living systems. Several workers have implicated toxic humoral factors as a constituent of the total-body irradiation syndrome. Thus, the possibility existed that the ingestion of flesh from irradiated animals might prove injurious. Beagle and greyhound dogs were fed the flesh from lethally irradiated beef and sheep Under the conditions of this short-term experiment, the data indicate that such flesh was not grossly injurious or toxic. These results were confirmed in other species, that is, in albino rats and chicks when they were fed the flesh or selected organs from irradiated animals.

SOUTH AFRICAN JOURNAL OF LABORATORY AND CLINICAL MEDICINE

Vol. 1, March, 1955

Nutritional oedema in the non-European in Cape Town. L. Eales, B. Bronte-Stewart, and J. F. Brock.—p. 1.

* Haemoglobin concentration and nutritional state in South African Bantu habituated to a very high iron intake. A. R. P. Walker.—p. 36.

Hemoglobin Level with High-Iron Intake. Correlation of hemoglobin concentration and nutritional state is not invariable, one important exception occurring when there is a high intake of iron, whether administered therapeutically, prophylactically, or involuntarily, as with the South African Bantu, whose habitual diet is exceptionally rich in iron. Iron intake is sometimes as much as 200 mg. per day. It is derived not only from foods in the usual diet but mainly from iron taken up from iron utensils during food preparation. It is reported here that among the South African Bantu mean hemoglobin values are likely to lie within or very little below normal limits, in spite of an inadequate diet, sometimes gross malnutrition, and frequent parasitization. Observations show that the habitually high iron intake acts as a "brake" on the depression of values associated with adverse dietetic and parasitic conditions. Among these people, therefore, no reliance should be placed on hemoglobin values in the appraisal of nutritional status.

THE TOHOKU JOURNAL OF EXPERIMENTAL MEDICINE

Vol. 61, February 25, 1955

* On free amino acids of human gastric juice. H. Tiba and S. Isikawa.—p. 189.

Free Amino Acids of Human Gastric Juice. The gastric juice of patients with gastric lesions was divided into five groups. Total and free nitrogen of non-protein nitrogenous compounds was compared. Paper partition chromatography showed the presence of free amino acids in gastric juice of all the groups of patients, but in gastric cancer, the amount and number of amino acids surpassed those in other diseases.

AMERICAN RESTAURANT MAGAZINE

Vol. 39, June, 1955

* Over 500 low cost meat dishes. C. E. Blackburne.—p. 80.

Vol. 39, July, 1955

* Pre-mixed profits in pre-mixed baked goods.—p. 66.
* 77 salads to pep up wilting appetites. C. E. Blackburne.—p. 116.

Low-Cost Meat Dishes. This article lists over 500 low-cost meat dishes, including 115 different ways to prepare beef, 87 for pork, 80 for veal, 60 for lamb; 120 ways to serve ham, bacon and sausage; 28 ways of preparing variety meats; and corned beef and hot sandwich suggestions. There is no need to limit the choice of dishes prepared from any type of meat, when there are many delicious, low-cost items that can be made. Casserole dishes and soup and sandwiches can help "over-production problems" through successful use of gravies and small portions of meat. Many of the cheaper cuts of meat can be made tasty and tender by braising. These menu suggestions use fruits and vegetables to give extensive variety to meats commonly served in restaurants.

Pre-Mixed Baked Goods. The food service institution has always had the problem of how to save time and money in the preparation of baked products and still maintain high quality. It is especially important to the restaurant owner who specializes in quick-service operation. Prepared mixes, which include products such as cakes, pies, muffins, coffeecakes, doughnuts, pancakes, and bread and batter mixes, make it possible to compute costs-per-serving down to the cent. The use of pre-mixed baked goods is also a time-saver, eliminating many baking steps and giving cooks time to variegate the different products. Since most of the ingredients are included in the mix, storage space is saved and there is little food waste. The food service operator has a closer cost control on baked goods, for he knows exactly how much the mix costs and what portions it will yield. Baking mixes have uniformly and consistently high quality results, and even an inexperienced operator, following directions, can turn out an excellent, appetite-appealing product.

Salad Recipes. This article gives recipes for 42 raw vegetable salads and 35 fruit salads. There are also some ideas for lettuce substitutes and tips on how food service managers may conserve fresh vegetables and food value by proper preparation and storage of salad materials. Some of these are: (a)

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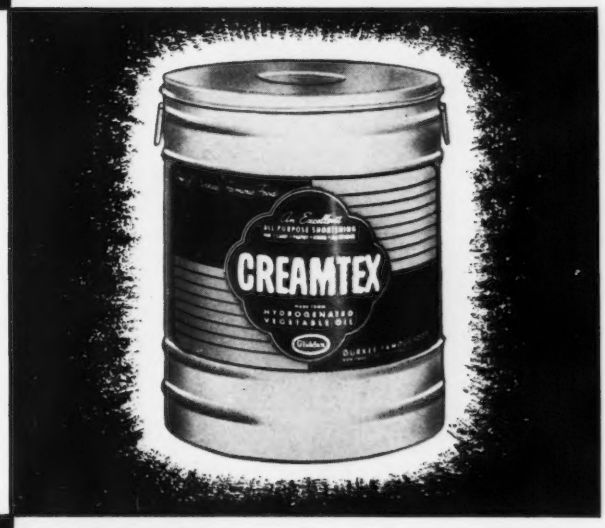

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buy first quality salad materials; (b) keep in refrigerator at 40° to 50°F. until used; (c) keep prepared salads in refrigerator until served; (d) dress salad greens as you serve them; and (e) use leftover cooked vegetables for salads.

COLLEGE AND UNIVERSITY BUSINESS

Vol. 19, July, 1955
* This kitchen has a future. L. H. Kotschevar.—p. 45.

Kitchen with a Future. Montana State University, in order to care for a rising student enrollment and increase the efficiency of present food services, has a new food service building with a service potential of 6000 meals a day. Joined to the new modern food service building is a new student union; a common kitchen serves both, and the entire facility is called M.S.U. Lodge. The architecture of the building is flexible to student needs, using large accordion-type doors to reduce or expand various areas. Primary consideration in planning the building was first to establish kitchen requirements, and then design the building around them. The result is a smooth flow of traffic and food. The use of both mobile and fixed storage racks, mobile hot and cold carts, and other modern equipment has increased service and reduced labor cost. Because each detail of required work was carefully plotted, the resulting design gives the greatest possible efficiency to each unit. The article contains floor plans of the Lodge.

FOOD ENGINEERING

Vol. 27, July, 1955
* Pace setting research. J. V. Ziemba.—p. 59.
Truest evaluations in sensory panel testing. J. K Krum.—p. 74.

Pace-Setting Research. A new research center, staffed by 148 scientists and technical specialists, has recently been built by a large container manufacturer. The center will probe container-use problems, aiming its scientific sights on the role canned products will play in the next half century. Current work will be devoted mainly to the improvement of containers in regard to providing greater protection and longer shelf-life for canned foods. One project, called "Operation Survival," is designed to seek tin alternates and eliminate this country's dependence upon tin as a can-making material. Metals being experimented with for this use include steel, chemically - treated steel, aluminum, steel coated with aluminum, and alloy coatings and metal combinations. Research is also being continued on atomic radiation of foods. Experiments are also being made in temperature-controlled hot and cold storage rooms to determine shelf-life and the quality of different canned foods. Food sterilization techniques, with the possibility of shortening or possibly eliminating heat sterilization, are being tested. Included are tests dealing with radiation sterilization and antibiotics. It has been observed that the antibiotic, Subtilin, has an inhibitory effect, under certain conditions, on specific food-spoilage bacteria.

HOSPITAL MANAGEMENT

Vol. 79, June, 1955
* A nutritionally adequate menu for the aged. S. Heend.—p. 90.
* The changing face of the dietary department. B. Hunzicker.—p. 92.

Menus for the Aged. Nutritionally adequate menus are a continuing goal and a challenge to the dietitian in the home for the aged. The adequate menu may be refused because of the many factors related to the aging processes, among them difficulty in mastication and disturbed digestion. The author of this article has an additional menu problem, because she is head dietitian in a Jewish home for aged. The religious requirements pertaining to the serving of meat, dairy products, and Kosher foods make additional requirements for each meal. This article, the first of a series, presents two dinner and two supper menus for each day of the week. The foods included are mildly seasoned, cooked very tender, and mashed or chopped.

Changes in the Dietary Department. Economic trends force the dietitian to re-evaluate the standards, goals, and methods of operation of her department. At one time food costs in hospitals were at least twice the cost of labor in dietary departments; today, because of the rise in labor costs, the two are equal, and often labor costs exceed the food cost. Today research is revolutionizing the food service industry, including food production, packaging, and transportation. Frozen and portion-cut meats, as well as new equipment, have completely changed methods of preparation. The development of management in industry has also greatly influenced the operation of the dietary department. Although management methods are not new to industry, the realization that they can successfully be applied to the management of the dietary department is a present-day concept which dietitians should realize and use. The reorganization of the dietary department must start from the bottom up. Basic organization, such as accepted standards for quality of food and service, is very important. Standards will set the policies of operation and become the basis for both a food and labor budget, as well as for equipment. A study of the methods of organization will determine whether or not the department is operating to its most efficient capacity. Organization takes into consideration all of the dietary department's operations, including menus, methods of cost accounting, and personnel relations.

HOSPITALS

Vol. 29, June, 1955
* Cooking the right way for quality.—p. 102.
Vol. 29, July, 1955
* Can a shared dietitian help you?—p. 102.
* Shared dietitian speaks—success lies in delegation of duties. B. D. Hoover.—p. 104.

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Quality. The development of the perfect food product—the best in quality, styling, and satisfaction—presupposes a well planned menu, use of standardized portions and recipes, sound purchasing procedures, and a well-designed, equipped, and maintained dietary department. A sound food production schedule with adequate supervision is another must. The preparation of nutritious and appealing food is an asset to any hospital since it not only satisfies the patient but plays an important role in restoring health.

Can a Shared Dietitian Help You? More than half of the nation's hospitals are institutions of less than 100 beds and generally provide hospital service for the rural areas and small communities. Most of these hospitals are without the services of a dietitian, due to the shortage of dietitians and the lack of sufficient funds. At the same time, these hospitals have put to use the vast knowledge of the importance of good nutrition to the total treatment of the patient. One solution to this problem is the shared dietitian program, for it provides the professional dietary supervision the small hospital wants and needs at a price it can afford to pay. The shared dietitian plan is successfully applied at Rush Memorial Hospital and Fayette Memorial Hospital in Indiana where a shared dietitian is employed. This article contains comments from a trustee, an administrator, and the medical staff of these two small hospitals, on the advantages of the shared dietitian program. All believe that the dietitian is needed for successful operation. The administrator commented that the food service has been greatly improved, that there has been a sharp reduction in food complaints, and that the whole dietary department has been brought up to date as a result of the addition of the shared dietitian.

Activities of the Shared Dietitian. Such questions as these are answered by a shared dietitian: Which hospitals are suitable for this dietary plan? How would you go about organizing a dietary department under this system? Where can you find a shared dietitian? Helpful suggestions are given for the delegation of duties in a hospital employing a shared dietitian. The parts played by the food service supervisor and tray service supervisor are most important. The dietitian herself is concerned with establishing a house diet, writing the menus, visiting patients, developing a procedure book, improving schedules, introducing standardized recipes, and improving purchasing procedures and inventory control.

INPLANT FOOD MANAGEMENT

Vol. 2, July, 1955

* Inplant interns. N. I. Phillips.—p. 16.

Inplant Interns. A large manufacturer provides a dietetic internship program in its twenty-one cafeterias and service dining rooms, which serve approximately 24,000 meals daily. The program is the first inplant dietetic internship established by an industrial concern, and the graduates are free to accept positions wherever they choose. In the program, the interns learn all phases of dietetic training, from the actual supervision of food preparation to the business administration aspects of managing a large cafeteria. Instruction and practical experience are provided in quantity food preparation, planning balanced menus, wholesale food buying, supervision of regular cafeteria personnel, and administering a nutrition education program. The interns are admitted in July and the program lasts for twelve months. In addition to the practical experience the intern receives she must attend classes one afternoon a week and participate in seminars and informal discussions of problems encountered in cafeteria or kitchen. Each intern is responsible for the development of an administrative project during the year. In transferring to different sections of the company, the intern gets experience in all types of food service management, plus business and industrial relations and health. Upon completion of the course, the intern is eligible for membership in The American Dietetic Association.

INSTITUTIONAL FEEDING AND HOUSING

Vol. 5, July, 1955

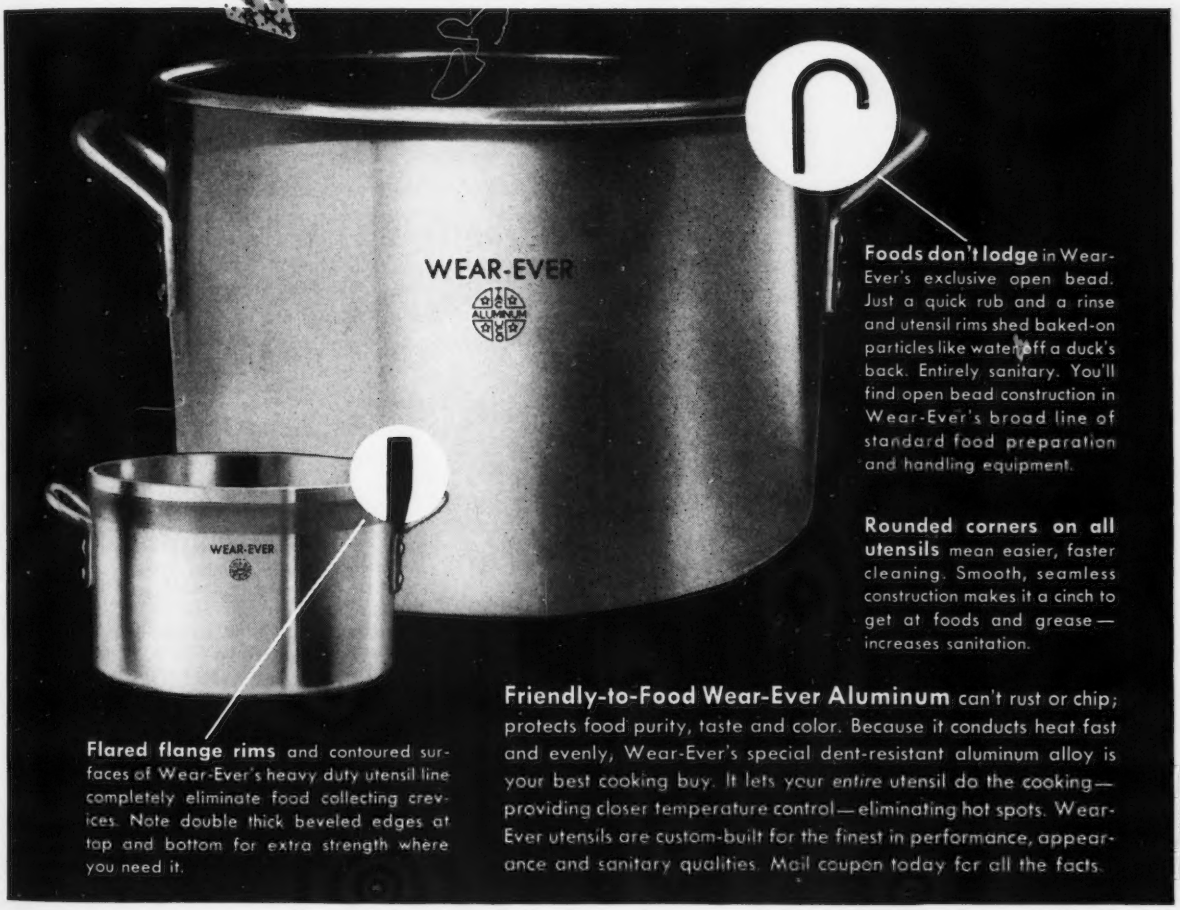
* Food waste is milking your profit. C. Draper.—p. 2.
* How to use and clean an electric deep fat fryer.—p. 12.
* How to remove common fabric stains.—p. 16.
* Sandwich fillings for 100.—p. 22.
* How to use a commercial pressure cooker.—p. 23.
* How to charcoal broil.—p. 29.

Food Waste Is Milking Your Profit. Food cost takes the largest part of the food service operator's dollar, and it is contributed to and determined by menu, buying procedures, preparation methods, portion controls, cooking temperature controls, refrigeration facilities, and employee meals. A savings in any one of these areas can be reflected in net profit. The menu is the most important part of food service operation, and periodic analysis of the menu is important, for items which are creating food waste or which are simply not popular can be dropped. Determining preparation costs will serve as a guide in menu pricing and will also determine whether or not kitchen personnel are spending too much time producing unprofitable, low-gross items. Making use of modern tools and production techniques in the kitchen—treating the kitchen as a food factory—will help cut waste and reduce costs. Examining food returned on plates, determining the cause—whether it is unedible or the portion is too large—will help in portion control. Portion control involves utensils and storage. Control of temperature, in both cooking and refrigeration, will add to profits and reduce food and fuel wastes. Uncontrolled employee meals mean less profit for any food service establishment, and a definite policy should be set up to control this system. If the operator will take care of waste, his food cost will take care of itself.

A PACE-SETTER IN SANITATION!

ONLY WEAR-EVER OFFERS YOU OPEN BEAD

IN EASY-TO-CLEAN, EASY-TO-KEEP CLEAN ALUMINUM COOKING UTENSILS



Foods don't lodge in Wear-Ever's exclusive open bead. Just a quick rub and a rinse and utensil rims shed baked-on particles like water off a duck's back. Entirely sanitary. You'll find open bead construction in Wear-Ever's broad line of standard food preparation and handling equipment.

Rounded corners on all utensils mean easier, faster cleaning. Smooth, seamless construction makes it a cinch to get at foods and grease—increases sanitation.

Flared flange rims and contoured surfaces of Wear-Ever's heavy duty utensil line completely eliminate food collecting crevices. Note double thick beveled edges at top and bottom for extra strength where you need it.

Friendly-to-Food Wear-Ever Aluminum can't rust or chip; protects food purity, taste and color. Because it conducts heat fast and evenly, Wear-Ever's special dent-resistant aluminum alloy is your best cooking buy. It lets your *entire* utensil do the cooking—providing closer temperature control—eliminating hot spots. Wear-Ever utensils are custom-built for the finest in performance, appearance and sanitary qualities. Mail coupon today for all the facts.

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A rich-flavored, fine American type cheese adds a tangy treat to salt restricted diets. Sodium content less than milk (9.5 mg. per 100 grams). In ½ lb. and 1 lb. packages.

CELLU WHITE WHEAT BREAD—Flavorsome canned bread made without added salt. Delicious plain or toasted. Sodium content only 0.004%. In 10 oz. tins.

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There's a better way to prepare hamburgers, fish cakes, etc., quickly and conveniently and economically and that's the Automatic Food Shaper way.

Here's why! Only the Automatic Food Shaper handles the food mixture gently and never bruises, crushes or mashes the food. This results in really superior tasting, fluffier, juicier food patties. And, best of all, expensive, unsanitary hand shaping is completely eliminated.

Remember, too, Automatic Food Shapers maintain rigid cost control with uniform portions. When desired, the portion size can be adjusted by merely turning a knob!

Write for literature that describes our three electrically driven models available with capacities of hundreds or even thousands of patties an hour—all with one operator!

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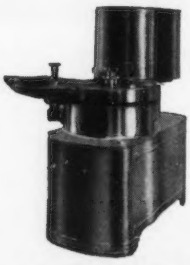
* or fish cakes, hash patties, veal or lamb patties, crab cakes or any other food mixture that can be served or portioned in patty form!



Model DA—Capacity: 2400 patties per hour

Care of Electric Deep Fat Fryer. This short article demonstrates, with illustrations, how to use and clean an electric deep-fat fryer. Loading the fryer, cooking, and cleaning are carefully detailed in seven steps.

Removal of Common Fabric Stains. Stains on upholstery fabric or carpeting should receive attention while they are still wet, if possible. Incorrect solutions can permanently damage materials. This short article gives two cleaning solution formulas for quick spot removal and tells how to use them when removing beverages, blood, butter and fats, chewing gum, ice cream or milk, ink, paint, varnish, shellac, furniture polish, and food stuffs.

Sandwich Filling Recipes. Six sandwich filling recipes for 100 sandwiches are given. The spreads are: cheese spread, bacon and egg filling, corned beef filling, meat loaf filling, deviled sausage spread, and bologna-cheese filling.

Pressure Cooker Operation. How to operate a commercial pressure cooker is shown in seven illustrated steps. A 30-lb. turkey is used as an example. Illustrations demonstrate how to open and close the door, precautions to take, and how to use a time gauge.

Charcoal Broiling. Seven photographs demonstrate how to charcoal broil. Details include assembling the broiler unit, setting the heating grates, lighting the burners, cooking, and cleaning.

INSTITUTIONS MAGAZINE

Vol. 37, July, 1955

An apple dish a day.—p. 33.

* Hors d'oeuvres made easy: patterned to precede.—p. 42.

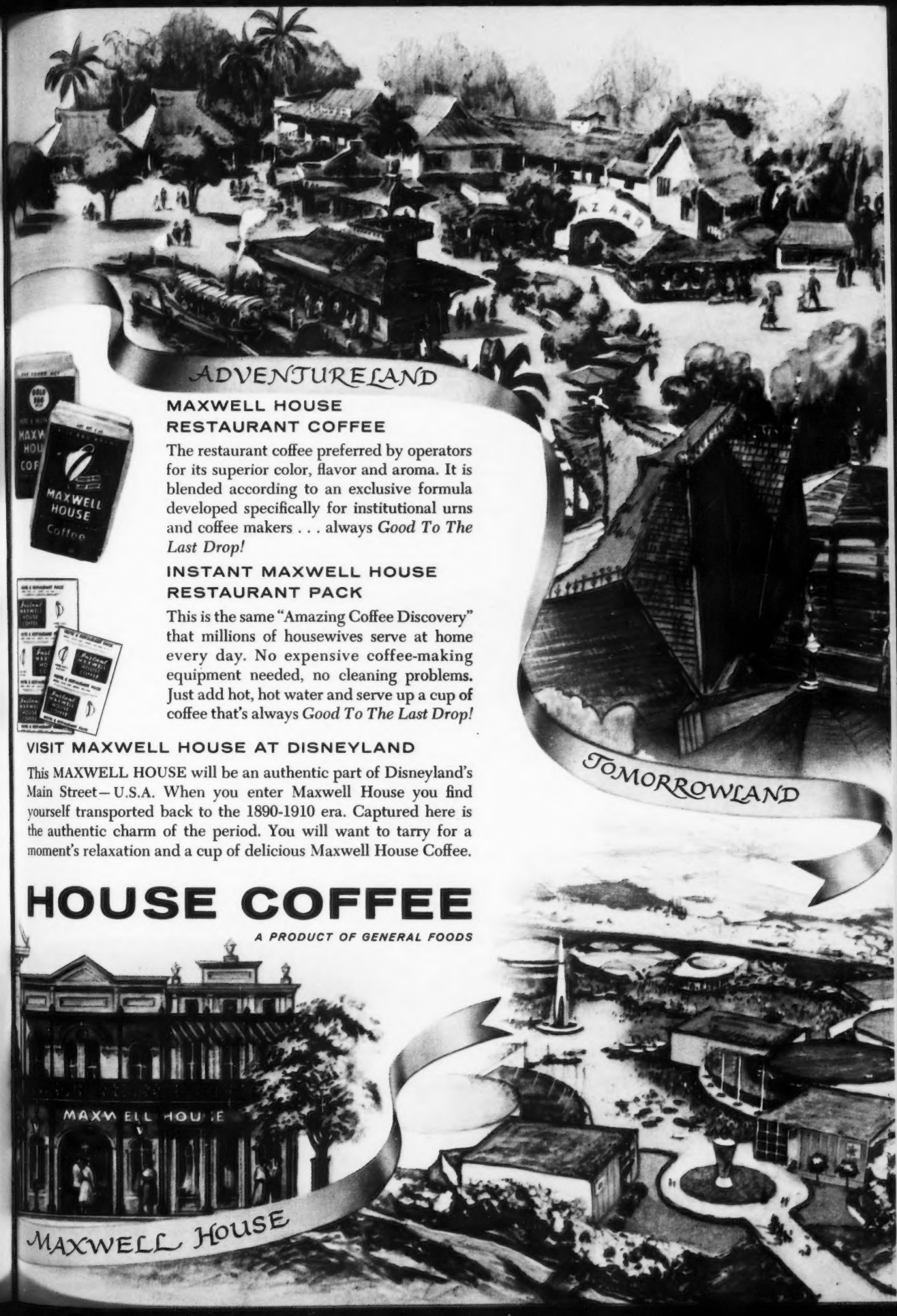
* Sanitation responsibilities in the kitchen. W. H. Haskell.—p. 46.

* "Training blueprint" builds skill. V. W. Eimicke.—p. 96.

Patterns for Hors D'oeuvres. Hors d'oeuvres, intricate enough to please the most sophisticated guests, can be prepared by unskilled workers. Step-by-step instructions, accompanied by illustrations, are given. The production of the trays of hors d'oeuvres is simplified through the use of illustrations.

Sanitation Responsibilities in the Kitchen. The quality of foods purchased, types and effectiveness of detergents and sanitizers, correctness of food preparation practices, proper direction of personnel, and the employment of sanitation in all the food activities utilized in the kitchen are the responsibility of the person in charge of the kitchen. Therefore, the training and directing ability of the kitchen supervisor is very important. Sanitation in the kitchen means careful attention to every operational detail. This article, as an aid to the kitchen supervisor, pin-points some of the various activities included in kitchen operations. These activities are in the following categories: (a) purchase recommendations; (b) store room; (c) food preparation; (d) refrigeration; (e) garbage disposal; and (f) personnel. Cleanliness is emphasized in every category.

"Training Blueprint" Builds Skill.



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The restaurant coffee preferred by operators for its superior color, flavor and aroma. It is blended according to an exclusive formula developed specifically for institutional urns and coffee makers . . . always *Good To The Last Drop!*

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This is the same "Amazing Coffee Discovery" that millions of housewives serve at home every day. No expensive coffee-making equipment needed, no cleaning problems. Just add hot, hot water and serve up a cup of coffee that's always *Good To The Last Drop!*

VISIT MAXWELL HOUSE AT DISNEYLAND

This MAXWELL HOUSE will be an authentic part of Disneyland's Main Street—U.S.A. When you enter Maxwell House you find yourself transported back to the 1890-1910 era. Captured here is the authentic charm of the period. You will want to tarry for a moment's relaxation and a cup of delicious Maxwell House Coffee.

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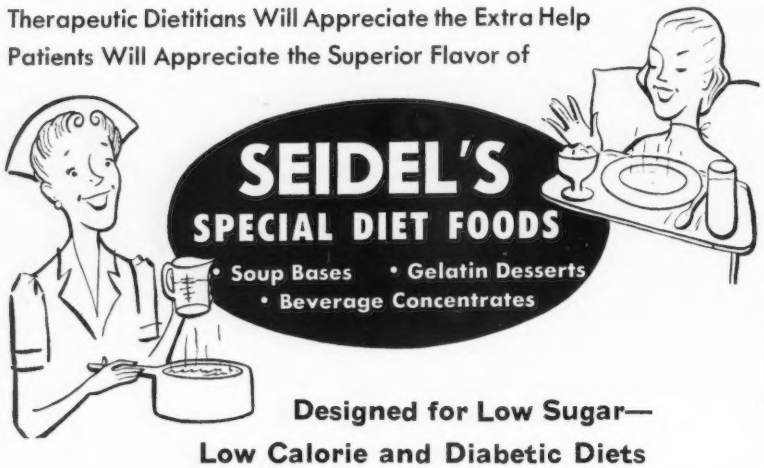
Therapeutic Dietitians Will Appreciate the Extra Help
Patients Will Appreciate the Superior Flavor of



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Developed in consultation with dietitians from many leading hospitals and chemists from Abbott Laboratories—Seidel's Special Diet Foods contain Sucaryl Calcium*, the new sweetening agent that is thirty times sweeter than sugar and *does not have any disagreeable after taste.* Taste panel tests show marked preference by patient for these new special-foods over anything presently on the market. Moreover, heating in any degree does not injure their palatability. All products are very simple to prepare for serving and will save much effort. Packed in convenient jars and bottles for use as needed Copy of Analysis by Independent Laboratory showing low Sodium and other content available on request. Price list and samples on request.

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All food is dished up and poured out in the main kitchen up to one hour before serving time. Hot food is kept piping hot, cold foods kept crisp and cold. You use your standard serving pieces. No need to purchase special dishes and trays with the HOSPITAL FOOD SERVICE CARTER.

Model H24 illustrated. Operates on 110 volt A.C. Other currents available. Four models from 18 to 24 plates. Special adaptations to fit your requirements. See the HOSPITAL CARTER at the 38th Annual Meeting of the American Dietetic Association in October, Booth 310.

WRITE TODAY TO

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Training is a process that is meaningless unless it has definite objectives and the operator knows exactly what he wants the training to accomplish. He must determine how the post-training behavior of trainees is to differ from the pre-training behavior. He must desire to change his trainees in one or more of the following types of behavior: (a) knowledge; (b) understanding; (c) skills; (d) attitude; (e) interests; or (f) appreciations. The use of a "training blueprint" will make the program as concrete as possible. Such a plan is described here and is divided into two categories: total objective and subject matter or content. The simple chart is then divided into sub-headings which present the different types of behavior. With this plan, or "training blue print," the trainer will have a concise idea of what he wants to accomplish, and how he can accomplish it.

THE MODERN HOSPITAL

Vol. 85. July, 1955

"Where does the dietitian fit in? Administrator says: "She should be administrator." E. W. Gilgan.—p. 106.

* Dietitian says: "She is when management lets her." E. Perry.—p. 106.

* Dietitian has two roles: executive and staff member. L. A. Zink.—p. 110.

The Dietitian as an Administrator. There seems to be a trend, according to the author, to place dietitians, who have just completed an internship, in the role of head of the dietary department. Although dietitians, when they go through their preliminary training, have some basic nutrition knowledge and some knowledge of purchasing, food control, food storage, and general subjects of an administrative nature, the new dietitian does not have the experience necessary to run the dietary department. Giving her such responsibility can be detrimental to the hospital as a whole and is not fair to the dietitian or to the patients. The head of the dietary department is one of the three top executives of the hospital, along with the administrator and the director of nurses. Under these three executives the major functions of the hospital in terms of personnel, money, and equipment are carried out. Good food service is essential in every hospital, but the problems of food service cannot be solved until the dietary profession fights for a higher caliber of employee for all jobs. It is a common misconception for the hospital administration to believe that any one who needs a job and who is not qualified for any particular kind of work, can work in the dietary department.

Dietitian's Point of View. The dietitian is definitely one of the top administrative executives in a hospital. Maturity is needed in the position of director of a department, and this is developed only through additional experience and training beyond the internship training. Appointment of a recent graduate to such a position is like appointing a student who has just finished his residency in administration to be administrator of the hospital, and such

uncommonly good for...

the most common nutritional defect

Whether garnishing a salad or fortifying a casserole dish, cottage cheese offers a most gratifying and wholesome solution for many problems that stem from "undernutrition." Not only has protein deficiency been singled out as "the most common nutritional defect in the aged,"[1] but inadequate dietary regimens are found with surprising frequency among children referred to physicians because of growth failure.[2]

Indeed, the stigmata of chronic undernutrition may be evident even before birth, when fetal bone and tooth impairment give telltale signs of poor mineral and vitamin intake by the mother. And the same dietary inadequacies may simultaneously take their maternal toll by precipitating such complications as eclampsia, vomiting, osteomalacia and premature labor.[3,4,5] The recommended diet of pregnancy and lactation, therefore, stresses *high calcium, high protein* and *low fat*[6]... requirements specifically fulfilled by cottage cheese.

The high protein diet, moreover, plays an important role in improving liver function,[7,8] and in significantly decreasing convalescence time following viral hepatitis.[9] In addition, neurologic and psychologic complications resulting from "undernutrition" are problems that confront pediatrician and geriatrician alike.[10,11,12]

And for all such patients, Borden's Cottage Cheese proffers so many advantages...easy digestibility because of low fat content...soft fine curds resulting from careful selection of bacterial "starters"... and as with all Borden dairy products, choice of only the finest of fresh pasteurized milk, hygienically skimmed and incubated, to serve as the basis of a cottage cheese with pleasing flavor to complement its high nutritional value.

1. Sebrell, W. H., Jr., and Hundley, J. M., in Stieglitz, E. J.: Geriatric Medicine, ed. 3, Philadelphia, J. B. Lippincott Company, 1954, p. 181.
2. Stevenson S. S.: Pediat. Clin. North America 1:433 (May) 1954.
3. Tompkins, W. T., and Wiehl, D. G.: Pediat. Clin. North America 1:687 (Aug.) 1954.
4. Macy, I. G., and Mack, H. C.: Am. J. Obst. & Gynec, 68:131 (July) 1954.
5. Burke, B. S.: Am. J. Clin. Nutrition 2:425 (Nov.-Dec.) 1954.
6. Murphy, G. H., and Wertz, A. W.: J. Am. Dietet. A. 30:34 (Jan.) 1954.
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10. Ant, M.: Am. J. Digest. Dis. 21:261 (Sept.) 1954.
11. Bakwin, H.: J. Pediat. 45:110 (July) 1954.
12. Cohn, H., et al.: Am. J. Digest. Dis. 21: 281 (Oct.) 1954.

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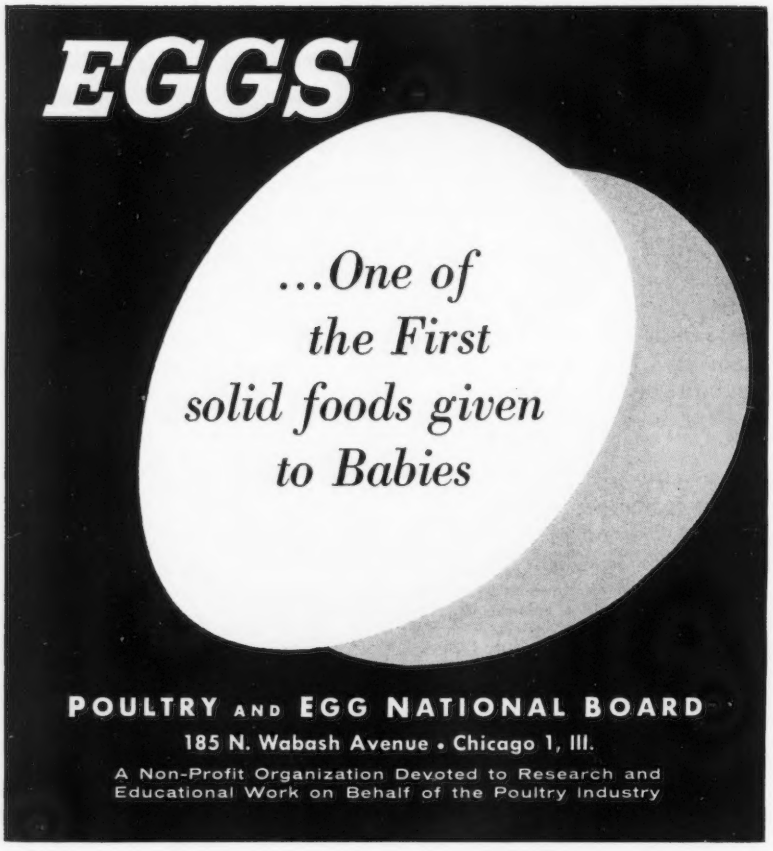
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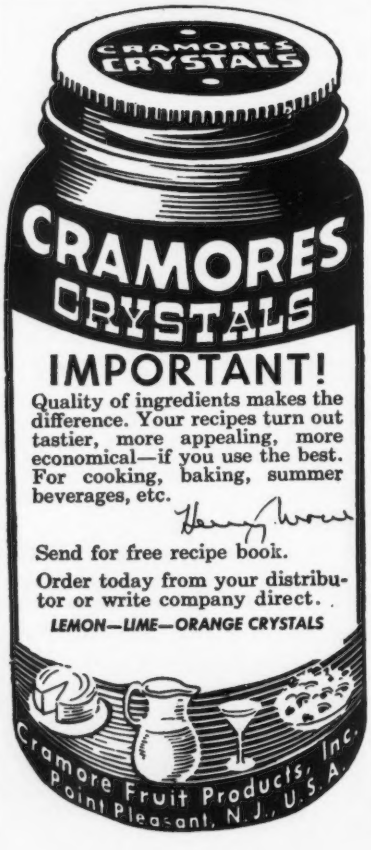
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an appointment reflects upon the administrator. If the dietitian and her functions have been relegated to a secondary position, this, too, reflects upon the administrator. In viewing hospital operations, the dietary department spends from 25 to 33 per cent of the operating budget (not including salaries). Furthermore, the services of the department reach every patient, staff member, and employee in the hospital. It can be the best public relations medium in the hospital. Only when the administrator and dietitian work on common ground toward an established goal can a successful job be done. Then, with appreciation by the administrator for the need of a better type of employee and with freedom of the experienced dietitian to develop and train personnel, the best administrative job can be done.

Two Roles of the Dietitian. A hospital dietitian must be both an executive and a staff member. In her role as an executive, the dietitian must apply the science of management, but she must combine it with art—the art of food production and intangibles of human relationships. The aspects of human relationships are highly important, for the encouragement and recognition of each employee as a person with problems and hopes of obtaining worth-whileness in life, and the success with which one is able to work through people and with people is essential to the dietary department as a whole. The dietitian as an executive must be able to direct the activities of others to accomplish a job. The selection of staff, improvement and development of job performance and the promotion of those with leadership qualities and supervisory abilities are important not only to the department, but to the hospital as a whole. As a staff member, the dietitian must work as part of the hospital team, keeping the administrator and the rest of the staff well informed of the activities of her department. The dietitian also has personal responsibilities of self-growth and improvement; she should be actively affiliated with professional groups, attend meetings, seminars, and courses, as well as keep up to date with current journals pertaining to her profession.

RESTAURANT MANAGEMENT

Vol. 77, July, 1955

* Kitchen in the dining room. H. Palmer.—p. 31. Kitchen bulletin board. P. Hustis.—p. 41.

Kitchen in the Dining Room. At a modern restaurant in Lancaster, Pennsylvania, the kitchen is located in the center of the dining room, and customers can see the entire operation. Most of the front and both sides are glass, and there is only one solid, non-glass wall at the back in the lounge-dishwashing area. Besides being unusual and attractive, the kitchen-in-the-center idea has many advantages: (a) waitresses have shorter distances to walk from kitchen to table; (b) guests can watch preparation of orders; (c) both kitchen and uniforms of kitchen help are kept cleaner; and (d) service can be handled by fewer employees.

FAST BOOSTER

INSTITUTE EACH SEPTEMBER FOR BETTER BREAKFAST BOOSTERS

A BETTER BREAKFAST

- As a result of their total findings, the research people believe the "best" breakfast is one which consists of the ordinary breakfast items and provides approximately one-fourth of the total daily requirement of calories and protein.
- For example, a person who needs 3,000 calories daily should eat a breakfast which provides approximately 750 calories. Assuming the protein requirement is 80 to 100 grams per day, the breakfast should contain about 20 to 25 grams of protein.
- Therefore, such a person probably would find a breakfast adequate if it included three and one-quarter ounces of fruit juice, one ounce of cereal, two slices of bread, one tablespoon of sugar, one pat of butter and one pint of whole milk. Coffee may be included or omitted as desired.
- For persons who require a larger breakfast, the menu may be increased 150 calories with the addition of two eggs, or 180 calories with the addition of two eggs and two slices of bacon. If a smaller breakfast is needed, the menu can be reduced 165 calories if one-half of the milk is omitted.
- From the physiologic point of view, the scientists believe the research has shown that breakfast is an "economic necessity," and that people should manage their time in such a way that permits inclusion of an adequate morning meal in the eating schedule.

Determination of Maximum Work Output.
Subject is shown riding a bicycle ergometer at maximum effort for one minute. Electric current thus generated, recorded as volts, is changed to work equivalent by the use of a calibration table.

Fifth September Better Breakfast Month

During the past six years twenty scientific papers have been published on the Iowa Breakfast Studies. From these experiments several practical and sound conclusions were reached that provided a good background for organizing September Better Breakfast Month, now in its fifth year, and sponsored by the Cereal Institute as a public service.

CEREAL INSTITUTE, INC., 135 South LaSalle Street, Chicago 3, Illinois
A research and educational endeavor devoted to the betterment of national nutrition

TENTATIVE PROGRAM, 38TH ANNUAL MEETING, THE AMERICAN DIETETIC ASSOCIATION
ST. LOUIS, MISSOURI—OCTOBER 18-21, 1955

All meetings, unless otherwise specified, will be held at the Kiel Auditorium, October 18-20.

Saturday, October 15

8:30 a.m.–2:00 p.m.—REGISTRATION, Hotel Statler

9:30 a.m.–4:00 p.m.—CONFERENCE OF DIRECTORS AND STAFFS OF APPROVED DIETETIC INTERNSHIPS, Hotel Statler

Sunday, October 16

11:00 a.m.–8:00 p.m.—REGISTRATION, Hotel Jefferson

1:30 p.m.–4:00 p.m.—CONFERENCE OF DIRECTORS AND STAFFS OF APPROVED DIETETIC INTERNSHIPS, Hotel Statler

Monday, October 17

8:00 a.m.–9:00 a.m.—REGISTRATION OF DELEGATES TO THE HOUSE OF DELEGATES, Hotel Jefferson

9:00 a.m.—MEETING OF THE HOUSE OF DELEGATES, Hotel Jefferson (members of the Association are urged to audit this meeting)

9:30 a.m.–8:00 p.m.—REGISTRATION, Hotel Jefferson

12:15 p.m.—LUNCHEON, Hotel Jefferson (members of the House of Delegates and Alternate Delegates only)

1:30 p.m.—MEETING OF THE HOUSE OF DELEGATES, Hotel Jefferson

8:00 p.m.–10:00 p.m.—WELCOMING EVENT—Honoring A.D.A. Executive Board, State Presidents, and Exhibitors—Hotel Statler

Tuesday, October 18

8:00 a.m.—BREAKFAST MEETING, HISTORY OF OUR ASSOCIATION—Anna Boller Beach, *Presiding*, Hotel Jefferson

8:00 a.m.—CONFERENCES AND DISCUSSION PERIODS (limited attendance), Hotel Jefferson
Weight Control Program
Sodium-Restricted Diets
Cost Control, Work Simplification
The Dietitian and Her Professional Associates

8:30 a.m.–4:30 p.m.—REGISTRATION, Kiel Auditorium

9:30 a.m.–5:30 p.m.—EXHIBITS, Kiel Auditorium

10:30 a.m.—OPENING SESSION
Invocation—Father John J. Flanagan, Executive Director, The Catholic Hospital Association of the U.S.A. and Canada, St. Louis
Introduction of Officers
Women's Role in International Health Today and in the Future—Florence Reynolds, Information and Educational Officer, Food and Agriculture Organization of the United Nations, Washington, D. C.

1:30 p.m.—BUSINESS MEETING OF MEMBERS OF THE AMERICAN DIETETIC ASSOCIATION

3:30 p.m.—NEWER FINDINGS
Absorption of Iron from Enriched Bread and Other Foods—Carl V. Moore, M.D., Department of Internal Medicine, Washington University School of Medicine, St. Louis
Food Intake and Hypnosis in Surgical Diseases—Morris J. Fogelman, M.D., F.A.C.S., Associate Professor of Surgery, The University of Texas Southwestern Medical School, Dallas

3:30 p.m.—KEYS TO MANAGEMENT
Motion Study in Food Service—Marvin E. Mundel, Ph.D., Vice Director, Management Center, Marquette University, Milwaukee
Supervisory Techniques—Cloyd S. Steinmetz, Ph.D., President, American Society of Training Directors, and Director of Sales Training, Reynolds Metals Company, Louisville
Leadership Development—Verne J. Kallejian, Ph.D., Director of Education, American Hospital Association, Chicago

8:00 p.m.—NUTRITION—TODAY AND TOMORROW, Hotel Jefferson
Advances in Nutrition—Jeffrey H. Fryer, M.D., School of Nutrition, Cornell University, Ithaca
Obesity–A U. S. Problem—James M. Hundley, M.D., Chief, Laboratory of Biochemistry and Nutrition, National Institute of Arthritis and Metabolic Diseases, Bethesda, Maryland
Meat and Future Health Needs—B. S. Schweigert, Ph.D., Division of Biochemistry and Nutrition, American Meat Institute Foundation, and Department of Biochemistry, University of Chicago

Wednesday, October 19

8:00 a.m.—CONFERENCES AND DISCUSSION PERIODS (limited attendance), Hotel Jefferson
Clinic in Community Nutrition Problems—Geraldine Piper, The University of Tennessee, Knoxville, *and* Marjorie Morrison, Florida Board of Health, Jacksonville, *Leaders*
Clinic in Diet Therapy Problems—Doris Johnson, Ph.D., Director of Dietetics, Grace-New Haven Community Hospital, New Haven, *Leader*
Selective Menus
Clinic in Food Administration Problems—Beatrice Donaldson, Ph.D., Department of Foods and Nutrition, University of Wisconsin, Madison, *Leader*
Realities of Today in Our Teaching of Foods and Nutrition

8:00 a.m.—SEMINAR: *Teaching of Students in Hospital Administration* (limited to those in this field and to directors of hospital dietetic internships)—E. Alliene Mosso, Director of Dietetics, St. Luke's Hospital, New York City, *Leader*

8:30 a.m.–4:30 p.m.—REGISTRATION, Kiel Auditorium

9:30 a.m.–5:30 p.m.—EXHIBITS, Kiel Auditorium

9:30 a.m.—RESEARCH IN ADMINISTRATION
Food Losses and Nutritive Content of Institutional Diets—Constance L. Brine, Ph.D., Consultant in Institutional Dietetics, Arthur D. Little, Inc., Cambridge
New and Improved Plants for Human Use—Albert H. Moseman, Ph.D., Director of Crop Research Service, U. S. Department of Agriculture, Washington, D. C.

9:30 a.m.—THERAPEUTIC NUTRITION
Protein Deficiencies in Surgical Patients—Robert Elman, M.D., Professor of Clinical Surgery, Washington University School of Medicine, St. Louis
Dietary Treatment of Liver Diseases—Robert E. Shank, M.D., Professor and Department Head, Department of Preventive Medicine, Washington University School of Medicine, St. Louis

9:30 a.m.—NUTRITION IN THE COMMUNITY
Diet and Nutritional Status of Older People—Esther L. Batchelder, Ph.D., Assistant Chief, Human Nutrition Research Branch, U. S. Department of Agriculture, Washington, D. C.
Suggested Revisions of the Basic Seven—Olive B. Hayes, Martha F. Trulson, D.Sc., and Fredrick J. Stare, M.D., Ph.D., Department of Nutrition, Harvard School of Public Health, Boston

11:15 a.m.—NUTRITIONAL DEFICIENCIES
Niacin Deficiency in Man—Grace A. Goldsmith, M.D., Professor of Medicine, School of Medicine, Tulane University, New Orleans
Endemic Cretinism in Europe—Josef Warkany,

M.D., Professor of Research Pediatrics, Children's Hospital Research Foundation, College of Medicine, University of Cincinnati

11:15 a.m.—LAYOUT AND EQUIPMENT—1955

The Layout of Your Kitchen—Margaret E. Terrell, Director, University Dining Halls, University of Washington, Seattle

Research and Newer Developments in Equipment—Leslie M. Scott, Director, Division of Hotel, Restaurant, and General Institution Management, Michigan State University, East Lansing

11:15 a.m.—STEPS TO SUCCESS

The Dietitian's Philosophy—The Necessary "Factor X"—E. J. Kircher, Ph.D., Professor of Educational Philosophy, The Ohio State University, Columbus

1:30 p.m.—CONFERENCE OF COLLEGE AND UNIVERSITY HOME ECONOMICS FACULTIES AND DIRECTORS AND STAFFS OF APPROVED DIETETIC INTERNSHIPS

1:30 p.m.–2:30 p.m.—CONFERENCES

Problems in Writing Diet Manuals—Lorraine G. Weng, Nutritionist, National Dairy Council, Chicago.

Equipment Problems—John W. Hargrave, Architect, Engineer, Food Service Consultant, Montgomery, Ohio

How Can Dietary Consultants Give Effective Service to Institutions?—Jane Hartman, Food Service Director, Maryland Department of Health, Baltimore

Mental Health—Frances Gibson, Head Dietitian, Spring Grove State Hospital, Catonsville, Maryland

Record Keeping—S. Margaret Gillam, Byron, New York

Role of the Dietitian in Metabolic Studies—Capt. Elinor Pearson, WMSC, Surgical Research Unit, Brooke Army Medical Center, Fort Sam Houston, Texas

School Lunch—Martha A. Russell, Director, Food Service, Oklahoma City Board of Education

Creative Teaching with Student Nurses—Eleanora Sense, Ph.D., Educational Dietitian, Wesley Memorial Hospital, Chicago

TV Techniques—Wilma Sim, KSD-TV, St. Louis

Thoughts about the JOURNAL—Martha F. Trulson, D.Sc., Harvard School of Public Health, Boston

8:00 p.m.—COMMUNICATIONS AND HUMAN RELATIONS, Hotel Jefferson

You and Your Speech—Earnest Brandenburg, Ph.D., Acting Dean, University College, Washington University, St. Louis

This Is Your Listening Life—Donald E. Bird, Ph.D., Executive Secretary, National Society for the Study of Communication, and Teacher of Communication, Skills, and Speech, Stephens College, Columbia, Missouri

Thursday, October 20

8:00 a.m.—CONFERENCES AND DISCUSSION PERIODS (limited attendance), Hotel Jefferson

Weight Control Program

Sodium-Restricted Diets

Cost Control, Producing Quality Food

Improving Our Teaching of Organization and Management

8:15 a.m.–9:00 a.m.—REGISTRATION OF DELEGATES TO THE HOUSE OF DELEGATES, Kiel Auditorium

9:00 a.m.—MEETING OF THE HOUSE OF DELEGATES, Kiel Auditorium

9:00 a.m.–4:30 p.m.—REGISTRATION, Kiel Auditorium

9:30 a.m.–5:30 p.m.—EXHIBITS, Kiel Auditorium

9:30 a.m.—MATERNAL AND INFANT HEALTH

Psychological Aspects of Infant and Child Feeding—Lois Murphy, Ph.D., Consultant, Department of Child Psychiatry, The Menninger Foundation, Topeka

Nineteenth Century Leaders in Infant Feeding—Lydia J. Roberts Essay Award Recipient

Nutritional Requirements of Pregnancy in Adolescence—Genevieve Stearns, Ph.D., Research Professor, Department of Orthopedic Surgery, State University of Iowa, Iowa City

9:30 a.m.—STRETCHING OUR SERVICES

Isola D. Robinson, Dietetic Specialist, American Hospital Association, Chicago, *Moderating Panel:*

Training the Food Service Supervisor—Elizabeth Perry, Assistant Superintendent and Chief Dietitian, City Hospital, Cleveland

Using Food Service Supervisor—Mary C. Zahasky, Internship Director, Dietary Department, University of Oklahoma Hospitals, Oklahoma City

The Food Service Supervisor in the School Lunch Program—Frances Welch, Director of School Lunchrooms, Dallas Independent School District

The Shared Dietitian—Betty D. Hoover, Dietitian, Rush Memorial Hospital, Rushville, Indiana, and Fayette Memorial Hospital, Connersville, Indiana

9:30 a.m.—STANDARDS FOR OUR PROFESSION

Staff Development—Roy Brener, Ph.D., Chief Clinical Psychologist, VA Hospital, Hines, Illinois

11:30 a.m.—CIVIL DEFENSE

Aspects of Protein Metabolism Following Radiation Damage—C. C. Lushbaugh, M.D., Los Alamos Scientific Laboratory, University of California, Los Alamos, New Mexico

Effect of Exposure of Foods and Foodstuffs to Nuclear Explosions—Edwin P. Laug, Ph.D., Director, Program 32 C.E.T.G., Division of Pharmacology, Food and Drug Administration, Department of Health, Education and Welfare, Washington, D. C.

11:30 a.m.—RESEARCH APPROACH TO YOUR FOOD PRODUCTION PROBLEMS

12:30 p.m.—HISTORY OF NUTRITION AND DIETETICS LUNCHEON—E. Neige Todhunter, Ph.D., *Presiding*, Kiel Auditorium

1:45 p.m.—HISTORY OF NUTRITION AND DIETETICS

Introductory Remarks Regarding Research on Pellagra—Adelia M. Beeuwkes, Associate Professor of Public Health Nutrition, School of Public Health, University of Michigan, Ann Arbor

Experiences of Dr. Goldberger—Mary Farrar Goldberger, Bay St. Louis, Mississippi

"G is for Goldberger"—Film

1:30 p.m.—NEW TRENDS IN ADMINISTRATION OF FOOD SERVICE

From:

The Hospital—Lucille M. Refshauge, Director of Dietetics, Hartford Hospital, Hartford

Commerce and Industry—Erma C. Burton, Aetna Life Insurance Company, Hartford

College—Lendal H. Kotschevar, Ph.D., Director, Residence Halls and Food Services, and Chairman, Home Economics Department, Montana State University, Missoula

School Lunch Program

1:30 p.m.—THE ART OF MANAGEMENT

Management Techniques—William C. Keown, Ph.D., Chairman, Department of Business Management, University of Oklahoma, Norman

One of the Keys-Supervision

3:30 p.m.—NEW DEVELOPMENTS IN FOODS

New Milks and Health Needs—H. E. O. Heineman,

Director, Research Division, Pet Milk Company, St. Louis

Food Technology Solves Your Problems—Gladys E. Vail, Ph.D., Head, Department of Foods and Nutrition, Purdue University, Lafayette

Chemical Additives in Foods—R. Blackwell Smith, Jr., Ph.D., Assistant President, Medical College of Virginia, Richmond

3:30 p.m.—TESTING EDUCATIONAL MATERIALS AND SERVICES

Evaluating the Booklet, "Planning Low Sodium Meals," and Implications for Dietary Instruction—Herbert S. Caron, Ph.D., Social Psychologist, Heart Disease Control Program, Division of Special Health Services, Department of Health, Education and Welfare, Washington, D. C.

Nutrition Counseling for Patients in a Community–A Pilot Study—Alla P. Meredith, Public Health Service Nutritionist assigned to Schenectady Department of Health, *and* Malcolm A. Bouton, M.D., Schenectady, New York

"A Food Guide to Restrict Calories"–A.D.A. Project—Doris Johnson, Ph.D., Director of Dietetics, Grace-New Haven Community Hospital, New Haven

3:30 p.m.—MEETING OF EXECUTIVE BOARDS, PUBLIC RELATIONS AND VOCATIONAL GUIDANCE CHAIRMEN OF STATE DIETETIC ASSOCIATIONS

3:30 p.m.—CONFERENCES

Problems in Layout—John Hargrave, Food Service Consultant, Montgomery, Ohio

Mental Health—Florence M. O'Brien, Chief, Dietetic Service, VA Hospital, Chillicothe, Ohio

School Lunch—Jean Riggs, Deerfield Township High School, Highland Park, Illinois

The Shared Dietitian

Training of the Food Service Supervisor

Teaching the Practical Nurse—Marjorie Simmons, Dietary Department, Ohio State University Hospital, Columbus

5:30 p.m.—EXHIBITS CLOSE

Friday, October 21

(All Friday meetings will be at the Hotel Jefferson)

8:30 a.m.—CONFERENCES AND DISCUSSION PERIODS (limited attendance)

Helping Our Senior Citizens to Good Eating—Izola F. Williams, Nutritionist, Ohio Department of Health, Columbus, *Leader*

Teaching of Patients—Charlotte Young, Ph.D., Professor of Medical Nutrition, Cornell University, Ithaca, New York, *Leader*

Producing Quality Food, Selective Menus

Continuing Staff Education

9:30 a.m.—2:00 p.m.—REGISTRATION

9:45 a.m.—FISCAL MANAGEMENT

Dollar Sense in Buying Beef—Capt. Marian J. Hayton, Food Service Officer, U. S. Air Force Hospital, WMSC, Wright-Patterson Air Force Base, Ohio

Labor Hours in the Dietary Department—Beatrice Donaldson, Ph.D., *and* Byrdine H. Tuthill, University of Wisconsin, Madison

Time Studies in Food Preparation—Harry H. Pope, President, Pope's Cafeterias, Inc., St. Louis

9:45 a.m.—DIET THERAPY—1955

Dietary Management of Children with Diabetes Mellitus—Robert L. Jackson, M.D., Professor and Chairman, Department of Pediatrics, School of Medicine, University of Missouri, Columbia, *and* Shirley W. Beckett, Research Assistant, University Hospitals, Iowa City

Research in Atherosclerosis—Fredrick J. Stare, M.D., Ph.D., Harvard School of Public Health, Boston

Metabolic Derangements after Injury—Capt. Elinor Pearson, WMSC, Metabolic Dietitian, Brooke Army Medical Center, Fort Sam Houston, Texas

9:45 a.m.—EDUCATIONAL PROGRAMS FOR STUDENT NURSES

Cooperative Working Relationships with State Leagues for Nursing and State Boards of Nurse Examiners—Edna L. Fritz, R. N., National League for Nursing, Inc., New York City

The Integrated Educational Program—Arlene Payne, Educational Director, Department of Dietetics and Nutrition, University of Kansas Medical Center, Kansas City, *Moderating*

Panel:

Physician—Robert Weber, M.D., University of Kansas Medical Center, Kansas City

Dietitian—Margaret Stark, University of Kansas Medical Center, Kansas City

Director of Department of Nursing—E. Jean M. Hill, R.N., University of Kansas Medical Center, Kansas City

1:00 p.m.—MEETING OF STATE COMMUNITY NUTRITION CHAIRMEN

1:00 p.m.—MEETING OF STATE DIET THERAPY CHAIRMEN

1:00 p.m.—MEETING OF STATE FOOD ADMINISTRATION CHAIRMEN

1:00 p.m.—MEETING OF STATE PROFESSIONAL EDUCATON CHAIRMEN

2:15 p.m.—CURRENT NUTRITION RESEARCH

Newer Findings on Amino Acids—Conrad A. Elvehjem, Ph.D., Professor of Biochemistry, and Dean of Graduate School, University of Wisconsin, Madison

Laboratory Investigations on the Maternal Diet During Pregnancy—Margaret L. Ross, Ph.D., Assistant Professor, Department of Foods and Nutrition, Iowa State College, Ames

Research on Survival Rations—Josef Brozek, Ph.D., Associate Professor, Laboratory of Physiological Hygiene, University of Minnesota, Minneapolis

2:15 p.m.—OUTLOOK FOR COMING YEARS IN ADMINISTRATION

Administration of Tomorrow—F. R. Bradley, M.D., Director, Barnes Hospital, St. Louis

Future in Equipment—John W. Hargrave, Architect, Engineer, Food Service Consultant, Montgomery, Ohio

Evaluation of the Dietitian—Jay L. Otis, Ph.D., Director of Psychological Research Services, Western Reserve University, Cleveland

2:15 p.m.—COMMUNITY NUTRITION IN THE FUTURE

Health Needs of Mothers and Children—Ansta T. Barr, Regional Nutrition Consultant, Children's Bureau, Department of Health, Education and Welfare, Dallas

The Senior Citizen—Meredith Jones, Nutritionist, Nutrition Association of Greater Cleveland

How We Can Best Participate in Local and State Health Agency Programs—Frieda Brackebusch, Secretary, Health and Hospital Division, Social Planning Council, St. Louis

4:00 p.m.—FIELD TRIPS

7:00 p.m.—ANNUAL BANQUET—Fern W. Gleiser, *Presiding*

Invocation—Reverend Leon R. Robinson, Second Baptist Church, St. Louis

Presentation of the Lydia J. Roberts Essay Award for 1955

Presentation of the Mary Swartz Rose Fellowship for 1955

Presentation of the Marjorie Hulsizer Copher Award for 1955

"Our TOASTMASTER Powermatic Toasters keep perfect pace with our assembly line"!

says H. M. Erichsen, Purchasing Agent
West Suburban Hospital, Oak Park, Illinois

New Powermatic Toasters provide the exact capacity needed as tray conveyor belt moves along.

Main kitchen, showing how toast is prepared as tray conveyor belt moves along. Two 4-slice "Toastmaster" Powermatic Toasters shown supply 200 trays per meal.

"Once our tray conveyor belt starts rolling, our toasters must keep pace," says Mr. Erichsen, Purchasing Agent. "Every slice must be perfect the first time. That's why we're so happy with these new Powermatic toasters. The girl merely drops in the bread and removes toast in perfect time with the tray conveyor belt."

Mr. J. M. Akre, Maintenance Superintendent, is equally enthusiastic. Says Mr. Akre: "We like this 'no levers to press' idea. It saves a lot of time, and it should add up to a longer life, because there's no banging or jarring. We also like the flexibility of these toasters. If we should decide to increase the number of beds, we can easily add just the toasting capacity we need."

Ask your food service equipment dealer to show you the most economical "Toastmaster"* Toaster for your needs. Any capacity, from 125 to 1000 slices per hour. Ask him, too, about the new Superflex timer, which automatically adjusts for voltage fluctuations and produces uniformly golden brown toast every time. Call him today!

†Prices slightly higher in Pacific Coast States

4-slice model
$134.50†

The New TOASTMASTER POWERMATIC TOASTERS

*"TOASTMASTER" is a registered trademark of McGraw Electric Company, makers of "Toastmaster" Toasters, "Toastmaster" Waffle Bakers, "Toastmaster" Hot-Food Servers, and other "Toastmaster" Products. Copr. 1955, TOASTMASTER PRODUCTS DIVISION, McGraw Electric Company, Elgin, Illinois.

COMMERCIAL EXHIBITORS—38th ANNUAL MEETING OF THE AMERICAN DIETETIC ASSOCIATION

KIEL AUDITORIUM

ST. LOUIS—OCTOBER 18-20

Aatell & Jones, Inc.
Adolph's Ltd.
Allen Foods, Inc.
A. S. Aloe Co.
Aluminum Cooking Utensil Company
Amcoin Corporation
American Can Company
American Dry Milk Institute, Inc.
American Gas Association
American Institute of Baking
American Machine & Foundry Company
American Molasses Company
Anetsberger Bros., Inc.
Armour & Company
Automatic Food Shaping Co., Inc.
Best Foods, Inc.
G. S. Blakeslee & Company
Blessing-Hoffmann Corp.
S. Blickman, Inc.
Boonton Molding Company
Borden Company
Buffalo Pottery Co.
Calgon, Inc.
Campbell Soup Company
Carnation Company
Cereal Institute, Inc.
Champion Dish Washing Machine Co.
Chicago Dietetic Supply House, Inc.
Chicago Molded Products Corp.
Cleveland Range Company
Cling Peach Advisory Board
Colt's Manufacturing Company
Continental Can Company, Inc.
Cory Corporation
Cramore Fruit Products, Inc.
Cream of Wheat Corporation
Crescent Metal Products, Inc.
Custom Food Products, Inc.
Dennis Water Cress, Inc.
Diamond Crystal Salt Co.
The Dietene Company
Dispensers, Inc.
Edward Don & Company
Doughnut Corporation of America
DuBois Company
Duke Manufacturing Company
Economics Laboratory, Inc.
Evaporated Milk Association
Fearn Foods, Inc.
Florida Citrus Commission
M. F. Foley Fish Co.
Food Machinery & Chemical Corp.
Foster Refrigerator Corporation
E. Fougera & Company, Inc.
W. H. Frick, Inc.
General Foods Corporation
General Grocer Co.
Gerber Products Company
Griswold Mfg. Co.
Hall China Co.
H. J. Heinz Company
Hertzel's Equipment Co.
Hilker & Bletsch Company
Hobart Manufacturing Company
Hotpoint, Inc.
Institutional Feeding & Housing
Institutions Magazine
International Minerals & Chemical Corp.
International Molded Plastics, Inc.
International Purchasing and Engineering Co.
Jarvis & Jarvis, Inc.
Jim Jak Industries, Inc.
Mead Johnson & Company
Kellogg Company
Kitchen Engineering Inc.
Klenzade Products, Inc.
Knapp Monarch Company
Charles B. Knox Gelatine Company
Koch Refrigerators, Inc.
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McGraw Electric Company
Mealpack Corporation
Meals-On-Wheels
Metropolitan Wire Goods Corporation
Middleby-Marshall Oven Co.
Midland Equipment Co.
Modern Maid Food Products Co.
National Assn. of Margarine Mfrs.
National Biscuit Company
National Cornice Works
National Cranberry Association
National Dairy Council
National Live Stock & Meat Board
National Pretzel Bakers Institute
National Turkey Federation
H. R. Nicholson Company
Samuel Olson Mfg. Co.
Onondaga Pottery Company
John Oster Mfg. Company
Peck's Products Co.
Pepperidge Farm, Inc.
Pet Milk Corporation
Pfaelzer Brothers, Inc.
Pillsbury Mills, Inc.
Processed Apples Institute, Inc.
Proctor & Gamble
Pro-phy-lac-tic Brush Co.—Prolon Plastics Div.
Public Health Committee of Paper Cup & Container Institute
Quaker Oats Company
Qualheim, Inc.
Quality Bakers of America
B. A. Railton Co.
Ralston Purina Company
Raytheon Mfg. Company
Rice Consumer Service
Rich Products Corporation
Rudd Manufacturing Co.
Salvajor Company
W. B. Saunders Company
Savory Equipment, Inc.
SeaPak Corporation
Ad. Seidel & Son, Inc.
Servco Equipment Co.
John Sexton & Company
Shampaine Electric Co.
SirSteak Machine Co.
Southern Equipment Co.
E. R. Squibb & Sons
Standard Brands, Inc.
Swartzbaugh Mfg. Company
Emery Thompson Machine & Supply Co.
Toledo Scale Company
Triumph Mfg. Co.
Tyler Refrigerator Co.
U. S. Vitamin Corporation
Universal Dishwashing Machine Co.
Vacuum Can Company
Webster Van Winkle Corporation
Victory Metal Mfg. Corp.
Waring Products Corporation
Watertown Manufacturing Company
Wesson Oil & Snowdrift Sales Co.
Williams & Wilkins Company
Wyandotte Chemicals Corporation

Vitamin B_{12} in the Elderly

Apparently, there is a defect in vitamin B_{12} in the elderly. According to Bacon F. Chow of Johns Hopkins University, vitamin B_{12} serum level is almost 50 per cent higher in subjects between twenty and forty years of age than in those between the ages of sixty and ninety. In speaking before the American Institute of Nutrition in Atlantic City last spring, Dr. Chow reported than when 1.0 mg. vitamin B_{12} was given orally, eleven out of twelve younger subjects showed a marked rise in serum B_{12} level, whereas only seventeen of forty-five older persons reacted in this way. When 0.25 mg. was given, five of eight younger persons showed an increase in serum level, compared to none of ten older subjects. Dr. Chow believes that the defective absorption of vitamin B_{12} in the elderly may be due to decreased gastric secretion as measured by the B_{12} binding capacity. Intrinsic factor is necessary for absorption of B_{12}—*Taken from Pfizer's Spectrum in J. A. M. A. 156: adv. p. 25, 1954 (Sept. 18, 1954).*

11 AWARDS FOR 1955

INSTITUTIONS ANNUAL FOOD SERVICE CONTEST

"Custom-bilt by Southern"

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Burdine's Department Store
Miami Beach, Florida

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Avalon Hotel
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Ames, Iowa

St. Michael's Hospital
Grand Forks, N. D.

HONOR AWARDS

Western Electric Co.
Winston-Salem, N. C.

Gimbel's South Gate
Milwaukee, Wisconsin

Milleman Restaurant
Kansas City, Missouri

Lady Classen Cafeteria,
Oklahoma City, Okla.

Wilson's Town 'N Country Cafe
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Bellarmine House of Studies
St. Louis, Missouri

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Photo Report 502—featuring Putsch's Cafeteria, Kansas City, Missouri
Photo Report 503—featuring Forum Cafeteria, Wichita, Kansas
Photo Report 504—featuring Western Electric Employee Cafeteria, Winston-Salem, North Carolina
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Briefs on the 38th Annual Meeting

St. Louis—October 18 through 21, 1955

MAJOR ATTRACTION

If you were to plan highly selective field trips, endeavoring to see the best in commercial food products and food service equipment, you would expend inestimable time and money. Fortunately, the need for such comparative shopping is circumvented by the Annual Meeting. Many of the country's leading companies are sending their products to you, in St. Louis, and they are sending key people to share their knowledge with you. Using the available time wisely, you can learn a great deal in three days at the Kiel Auditorium.

You may wish to plan your itineraries for each day, reviewing the firms listed on this page in the July and August issues of the JOURNAL, checking those which follow and those which will be mentioned in *ADA Lines*. Booth numbers will be given in the program.

IN SMART ARRAY

Two new products, recent additions to grocers' shelves across the country, will be featured by the *Carnation Company*. A delectable beverage, Carnation Instant Chocolate Drink, made available in August, is one. It consists of magic crystals of Carnation Instant Milk and chocolate and is instantly soluble in either cold water or milk. Carnation Instant Milk, introduced last fall, will also be served.

You are invited by *Armour and Company* to stop by for specially developed, low-cost recipe material and a brochure on Armour's new color film. Many attractive colored slides of food service will be displayed.

The new deluxe Osterizer will be shown by the *John Oster Mfg. Company*. It offers speed selectivity, special Hi and Lo speeds, styled beauty, and increased power—all for easier, faster, and better methods of food preparation.

You will be interested in trying a product called "Brown Swiss" dry creamed cocoa, which contains milk, cream, and imported Swiss chocolate. Made available by the *Webster Van Winkle Corporation*, it requires merely the addition of water to become a heavy bodied hot chocolate. Van Winkle's Concentrated Gelatin, packed without sugar, and other items will also be on display.

Representatives of the *Duke Manufacturing Company* will acquaint you with the improved models of Thurmaduke, the original waterless food warmer with selective heat control. It will be worth your while to obtain the new illustrated catalog, No. 555, which shows the new integral dish shelf with easy-to-reach controls and the recently designed plate-storage carts which roll into the base.

The Chicago Dietetic Supply House, Inc., plans to discuss with you its variety of Cellu fruit purées and Cellu vegetable purées which are packed without sugar and salt. These products are suitable for modified diets.

A complete line of fully prepared baking mixes will be exhibited by *Modern Maid Food Products Co.* Muffin, hot roll with yeast incorporated, pie crust, doughnut, biscuit, waffle, pancake, and eight well-known cake mixes comprise some of the products which are packed exclusively for institutional use.

A working scale model of the subveyor and two Olson Dish tray conveyors will be displayed by the *Samuel Olson Mfg. Co.* Also on view will be stainless steel and composition dish boxes and a stainless steel rack return conveyor. Color transparencies will illustrate some of the company's representative hospital installations.

Administration, therapeutics, teaching, community nutrition—no matter which branch of dietetics claims you—you'll find something helpful in the "Dietitian's Kit," offered by *Ralston Purina Co.* Diet booklets and leaflets, quantity and family-size recipes, teaching aids—there's one copy of each in the kit.

Representatives of *W. H. Frick, Inc.*, will demonstrate the efficiency of super duty mobile equipment with ball-bearing rotary rubber bumpers. It will include mobile equipment for dishwashing and dispensing, for storage and food service.

A telephone and message center for the convenience of conventioniers will be provided through the courtesy of the *Campbell Soup Company*. Campbell, Franco-American, Swanson, and V-8 products will be exhibited. Quantity recipes and teaching aids will be offered.

What do you know about the ubiquitous pretzel? *The National Pretzel Bakers Institute* will be glad to elaborate about this curvaceous tidbit.

Legion Utensils Company will present for your inspection six new products: table-tilting, steam-jacketed kettles featuring sanitary open bead; four-ply, copper-bottom cooking utensils; a fully automatic, gas-fired steam kettle; a new vacuum server; a one-piece seamless drawn sandwich box with stacking device; and a dry hot plate unit with a new heating disc.

A 1-gal., commercial size Waring Blendor for institutional use has been developed in response to a demand by industrial and institutional users of the original appliance. This is the first time that a high speed electrical device with distinctively "blending" action has been offered with a capacity of more than 37 oz. Representatives of *Waring Products Corporation*, a subsidiary of Dynamics Corp. of America, will describe its many uses.

Sustagen, a therapeutic food for complete nutrition, will be featured in the *Mead Johnson & Company* exhibit. Supplied in convenient powdered form, Sustagen may be used for tube feeding or as a beverage. When mixed with water, Sustagen alone will supply all nutritional needs of a patient, even for prolonged periods.

The *Cleveland Range Company*, manufacturer of Steam-Chef and Steamcraft steam cookers, will exhibit a number of its most successful products, including the cafeteria pan steamer and the Steamcraft steam cooker which is suitable for smaller quantities. The units are available for use with direct steam, gas, or electricity.

Lily-Tulip Cup Corporation extends a cordial invitation to you to view a display of cups, containers, dishes, and plates for complete or partial food service. Several new containers will be introduced.

The *American Molasses Company* will welcome registrations from those of you who would like to receive sets of quantity recipes as well as other recipe material suitable for individual servings. The values and versatility of Grandma's unsulphured molasses will be pointed out to you.

In proud array will be four samples of the more than two hundred models of matched equipment produced by the *Foster Refrigerator Corporation*. Foster extends a warm welcome to you to explore the modern restaurant-sized reach-in refrigerator, upright freezer, two-temperature refrigerator, and flat-top beverage cooler.

A demonstration of Calgon Rinse-Aid, a new nonfoaming wetting agent designed to take the spotting and filming out of restaurant dishwashing, will be one of the features of the *Calgon, Inc.* booth. An automatic dispenser introduces the concentrate directly into the rinse line.

At the *Pillsbury Mills, Inc.* booth, you will see a brand new way to get 25 per cent more servings from an angel food cake. The solution lies in the new Pillsbury H & R Angel Food Cake Mix and the company's unique "plus-portion" loaf pan . . . a portion cost controller that pays off with the first cake baked. The popular Pillsbury H & R Orange Cake Mix also will be featured.

Among the *Williams & Wilkins Company* books which will be available for your perusal are: *Applied Dietetics* by Stern; *Food and Nutrition* by Cruikshank; *A Story of Nutritional Research* by Mellanby; *Food and the Principles of Dietetics* by Hutchison; *Modern Dietary Treatment* by Abrahams and Widdowson; *Vitaminology* by Eddy; *Tropical Nutrition and Dietetics* by Nicholls; and *Nutritional Diseases of the Nervous System* by Spillane.

For Humanity... for Country... for Self...

–serve as an Army Dietitian!

An Army career satisfies in *all* ways! It is satisfying for you professionally. As a part of your normal activity you have learning opportunities. These enable you to do the most for your patients by consistent improvement of your own skills. You also serve in fine, well-equipped Army hospitals.

And the work you accomplish benefits your country directly . . . because each soldier returned to active duty strengthens the nation. That's the reason you begin your career as an officer among officers, enjoying equal standing and privileges with other Army professional people.

Your career is satisfying from every angle . . . personally as well as professionally. Travel, new friends and an officer's salary give you ample opportunity to broaden your horizons. And in addition to your other officer benefits, you enjoy a 30 day vacation with pay every year.

Consider your career as an Army Dietitian.

Women's Medical Specialist Corps

U.S. ARMY MEDICAL SERVICE

FILL OUT THIS COUPON TODAY

D 55-4

The Surgeon General, United States Army
Washington 25, D. C.
Attn: Personnel Division

Please send me further information on my opportunities as a Dietitian in the United States Army.

☐ *Check if also interested in training opportunities.*

Name_____

Address_____

City_____ State_____

My present status is (check one)

STUDENT:
___High School
___College
___Dietitian

GRADUATE:
___College
___Dietitian

OTHER:_____

To keep up to date with innovations in baking and cooking utensils and cutlery, you will want to visit *The Aluminum Cooking Utensil Company* booth. A new series of bake and roast pans will be shown which are especially designed to fit into the ovens of modern ranges and to utilize all the usable space in them. A complete line of cooking utensils and of cutlery will be shown.

Plan to pause to sample a variety of delicious foods at the *Hilker & Bletsch Company* booth. You will be asked to try the new HBC instant pudding powder, Welsh rarebit, beverage bases, and other items. You will see a complete line of food specialties for desserts, salads, and beverages.

A newcomer among exhibitors is the *Shampaine Electric Co.* of New Rochelle, New York, with a division of the company in St. Louis. It will present for your inspection a few representative food trucks of its complete and newly designed line of electrically heated food and tray conveyors.

The latest addition to the *Hobart Manufacturing Company's* equipment, the Hobart Food Waste Disposer, will be demonstrated for you. Food, kitchen, and dishwashing machines will be available for inspection.

Many dietitians are using Bombay California Valencia orange and grapefruit bases, not only as mealtime beverages but also as between-meal nourishments and as "bad-taste chasers" with medication. The *H. R. Nicholson Company* wishes you to become acquainted with the Bombay products because of their taste appeal and their nutritional character.

Something new is promised you by *Adolph's Ltd.* It is a pocket-sized "Sodium Calculator"—for quick, accurate tallying of amounts of sodium in all foods. You are invited to sign for your copy and obtain samples of Adolph's Salt Substitute and Adolph's Dietetic Meat Tenderizers (with spices and without spices).

You will see dishwashing problems washed away in the *Du Bois Company* display of a new compound, Kloro-Kol, which prevents the formation of stain on china or plasticware, and Rins-o-Lator which infuses Dri-It into the final rinse to produce spotlessly dry, sparkling ware without toweling.

Representatives of the *A. S. Aloe Co.* are looking forward to showing you splendid new developments in food service equipment. The Aloe Service Pantry will be assembled for your inspection.

National Dairy Council will feature an exhibit based on weight control studies conducted at Michigan State University. Health and nutrition education materials and visual aids also will be on display.

Koch Refrigerators, Inc., will invite your attention to the unique Koch Food File for hard-to-stack items, the convenient pass-through arrangement, and representative samples of self-contained and remote units.

Pepperidge Farm, Inc. will emphasize Pepperidge whole wheat bread made from stone-ground, unprocessed flour, as a high protein product. White bread, made from unbleached flour, rolls and herb-seasoned stuffing will be included in the exhibit.

Utility cabinets, racks, and many new products will be displayed by *Crescent Metal Products, Inc.* You will be able to examine a versatile cabinet food conveyor with provisions for transporting both hot and cold foods, a new hot cabinet, and a complete self-contained frigid cabinet.

Quantity recipes and information pertaining to fish and shellfish will be furnished you when you visit the *Fish and Wildlife Service* exhibit. You will also be given an opportunity to "Test Your Fish I.Q."

Most recent publications on nutrition and food planning will be displayed by the *Human Nutrition Research Branch, Agricultural Research Service, U. S. Dept. of Agriculture.* Up-to-date lists of publications and visual aids may be obtained at the booth.

You have an opportunity to obtain the advantage of Income Continuance while disabled . . . at a substantial saving in premium cost. If you are not a subscriber of the A.D.A. Group Program of Sickness and Accident Insurance, you will learn of its advantages by stopping at the booth of the *Joseph K. Dennis Co., Inc.*, our group insurance administrators.

Ad. Seidel & Son, Inc., manufacturing food specialist, is looking forward to acquainting you with its Cake Craft Mixes. Exceptionally fine texture, grain, and flavor are assured in all of the varieties. Both excellent and unusual are Scotch Lassie and Choc-O-Malt Cake Craft Mixes, offered exclusively by Seidel.

"Cloverlane," the melamine dinnerware which was introduced this spring, will be shown by its manufacturer, the *Chicago Molded Products Corp.* Cloverlane's many design features make this dinnerware especially adaptable to modern dishwashing by eliminating sharp corners and edges and by improved drainage and aeration.

A most accommodating genii of the institution kitchen is the new Salvajector. It will be demonstrated for you by *Salvajor Company.* Redesigned, the new Salvajector has flexibility of operation that the former model did not have. When food preparation waste needs to be removed, the disposer alone may be in operation. By turning on a second electric switch and placing the salvage basin in position, the Salvajector is ready to assist in the preparatory operation involved when the soiled tableware is returned to the dish table.

If you would like to have potatoes cooked in just 5 to 7 min., be sure to see *Hotpoint's* all-electric High-Compression Steam Cooker. It is designed to cook foods over three times as fast as ordinary methods. Speeds up to ten times faster are not uncommon. As many as three different foods may be cooked at once. Another Hotpoint marvel is the new Rocket 12 Griddling Machine, which can produce over 700 ¼-lb. hamburgers every hour.

The advantages of the new Wesson Poriscope can will be explained to you by representatives of the *Wesson Oil & Snowdrift Sales Co.*, and you will see a frying demonstration featuring Heavy Duty MFB. Register at the booth and you'll be mailed three very useful and practical formula booklets.

The *Borden Company* invites you to the display of its complete line of prescription food products as well as fluid milk, dry milk, condensed milk, and ice cream products. Leaflets and booklets about these products will be on view for your inspection and may be ordered at the booth.

A DIRECTORY OF EXHIBITORS comprised of a complete listing of A.D.A.'s 1955 exhibitors will be available at the Annual Meeting as well as at the headquarters office shortly thereafter. Those mentioned in the July, August, and September issues of the JOURNAL represent only about half of the commercial and educational exhibitors.

If you would like to communicate with the exhibitors, to obtain catalogues or descriptive literature concerning their products or services, you may request a directory which will be provided without charge.

SIGHTSEEING TRIPS

The following possibilities for diversion before and after October 18–21 are merely listed at this time. Complete details will be given you in the September letter to the membership.

Ste. Genevieve, the first permanent settlement established in Missouri, in 1735, by the French; *Hannibal, Missouri*, early home of Mark Twain; Gray Lines Tours Inc.—2-hr. morning trip and a 3½-hr. afternoon trip

University of Missouri in Columbia

Wholesale Produce Market

Southern Equipment—3 plants, showing custom-built equipment.

Southwestern Bell Telephone Co.—a unique operation of scheduling in a cafeteria open 16 hr. a day.

First National Bank's new food service with its prize-winning kitchen.

Pet Milk Co.'s test kitchen. Watch recipe testing in the use of nonfat dry milk solids.

Ralston Purina Research Laboratories—take the opportunity to see nutrition studies on animals; vitamin, mineral and protein analysis.

See the Coffee Room of the *Forest Park Art Museum.*

Julier Carry Out Food Shop—a unique carry-out service to office workers.

Home Economics Department, Fontbonne College.

Definitely scheduled are tours of several *hospitals*: St. Luke's; Barnes Hospital Group; John Cochran VA Hospital, and Missouri Pacific Hospital.

Application for Housing Accommodations

THE AMERICAN DIETETIC ASSOCIATION

St. Louis, Mo. • October 18–21, 1955

For your convenience in making hotel reservations for the coming meeting of THE AMERICAN DIETETIC ASSOCIATION on October 18–21, 1955 in St. Louis, hotels and their rates are listed below. Use the form at the bottom of this page, indicating your first, second and third choice. Because of the limited number of single rooms available, you will stand a much better chance of securing accommodations of your choice if your request calls for rooms to be occupied by two or more persons. All reservations must be cleared through the Housing Bureau. ALL REQUESTS FOR RESERVATIONS MUST GIVE DEFINITE DATE AND HOUR OF ARRIVAL AS WELL AS DEFINITE DATE AND APPROXIMATE HOUR OF DEPARTURE, ALSO NAMES AND ADDRESSES OF ALL PERSONS WHO WILL OCCUPY RESERVATIONS REQUESTED *MUST* BE INCLUDED.

Hotel	For one person	For two persons		2-Room Suites
		Double Bed	Twin Beds	Parlor & Bedroom
JEFFERSON*	6.00– 9.00	9.00–12.00	11.00–15.50	25.00–39.50
LENNOX	5.00–10.00	6.50–10.50	10.00–12.50	18.00 & Up
MARK TWAIN	4.00– 7.50	5.50– 9.00	8.00– 9.00	12.50 & Up
MAYFAIR	5.00–10.00	6.50–12.00	8.50–12.00	14.50 & Up
STATLER	5.00–11.00	7.50–14.00	9.00–18.00	30.50–32.00

In the event that the hotel room rate structure is changed prior to the above convention these rates will be changed accordingly. (See map on page 530—May issue)

* Headquarters

ALL RESERVATIONS MUST BE RECEIVED PRIOR TO: September 18, 1955

Hotels Convention Reservation Bureau, A.D.A.
Room 406—911 Locust St.
St. Louis 1, Mo.

Please reserve the following accommodations for: THE AMERICAN DIETETIC ASSOCIATION Convention in St. Louis, Missouri on October 18–21, 1955

Single Room.....Double Bedded Room.....Twin Bedded Room.....
2 Room Suite.....Other Type of Room.....
Rate: From $.....to $.....

First Choice Hotel.....
Second Choice Hotel.....
Third Choice Hotel.....

Arriving at Hotel (date).....hour.....A. M.....P. M. Leaving (date).....
hour.....A. M.....P. M.

THE NAME OF EACH HOTEL GUEST MUST BE LISTED. Therefore, please include the names of *both* persons for *each* double room or twin bedded room requested. Names and addresses of all persons for whom you are requesting reservations and who will occupy the rooms asked for:

.....
.....
.....
.....

(Individual Requesting Reservations)
Name.....

Address.....

City and State.....

If the hotels of your choice are unable to accept your reservation the Hotels Convention Reservation Bureau will make as good a reservation as possible elsewhere provided all hotel rooms available have not already been taken.

News Notes

Home Economics Research. The Home Economics Research Advisory Committee of the U.S.D.A., which met in Washington, D. C., July 11 to 13, recommended a balanced and expanded program of research in all fields of home economics. Among the more than fifty recommendations considered in food and nutrition were: (a) to initiate laboratory analyses on carbohydrates in foods to replace incomplete or obsolete data that are likely to give erroneous results in diet planning and appraisal; and (b) to expand analyses of nutrients in foods to obtain data on new foods and new forms of common foods which are not now included in tables of food composition. The committee also made several recommendations regarding textiles and clothing, housing and household equipment, and family economics.

***Hospitals* Magazine, Twice Monthly.** *Hospitals*, the journal of the American Hospital Association, will be published twice monthly beginning January 1, 1956. Demands from the field for more information at a more frequent rate required that the Association take this step. The magazine will be published the first and sixteenth of each month. The editorial staff is being expanded to prepare more information and new departments for the magazine. The cover of the publication will be changed to feature pictures.

Cumulative Index of Hospital Literature. The American Hospital Association has just published the 1950–1954 *Cumulative Index of Hospital Literature*, which lists articles in more than 400 periodicals in the hospital and related fields published during the past five years. The *Index* costs $6 and may be supplemented by the *Index to Current Hospital Literature* which is published semi-annually. Subscription to the latter is $3 per year.

Dr. Sebrell Retires. Assistant Surgeon General William H. Sebrell, Jr., who has been Director of the Public Health Service's National Institutes of Health, retired August 1, after thirty years' service. Dr. Sebrell has accepted appointment as Research Consultant for the American Cancer Society and will direct the Society's institutional research grants program. He has earned a worldwide reputation as a member of the Public Health Service team that established the dietary origin, prevention, and treatment of pellagra. In the course of his work, Dr. Sebrell discovered the cause and cure of another deficiency disease, ariboflavinosis. He has also received scientific acclaim for important findings in the dietary cause and treatment of liver disease, the effect of pantothenic acid deficiency on the adrenal glands, nutritional effects of sulfa drugs, and the cause and treatment of blood abnormalities.

The new Director of the National Institutes of Health, succeeding Dr. Sebrell, is Dr. James A. Shannon, who has been Associate Director of the Institutes since 1952. His principal responsibilities have included development of the National Institutes of Health direct research program. He is also chairman of the Public Health Service's Technical Committee on Poliomyelitis Vaccine. Seven research centers comprise the Institutes: these centers cover cancer, heart disease, neurological diseases and blindness, arthritis and metabolic diseases, mental health, dental research, and microbiology. The Institutes also include the site of the Clinical Center, a new 500-bed research facility opened in 1953. Other major programs of the NIH include substantial financial support through research grants to investigators in non-federal institutions and support of research fellowships and clinical traineeships.

Joseph G. Norby Honored. Joseph G. Norby, hospital administrator for many years and presently a hospital consultant and executive secretary of the Milwaukee County United Hospitals Fund, has been chosen as the 1955 recipient of the American Hospital Association's highest honor—the Award of Merit. The award will be presented to Mr. Norby on September 21 at the annual banquet of the American Hospital Association's annual convention in Atlantic City.

The following list of foods expected to be plentiful in September has been released by the U. S. Department of Agriculture:

Protein foods

Beef
Chickens—broilers and fryers
Milk and other dairy products
Pork
Tuna—canned

Other foods

Grapefruit sections—canned
Grapes
Italian prunes—fresh
Lard
Lemons—fresh and processed
Limes—fresh and processed
Potatoes
Rice
Vegetable fats and oils
Vegetables—summer

Body - Build - and - Blood - Pressure Study. The first study of mortality in relation to build in nearly twenty-five years and the first investigation of persons with abnormal blood pressure since before World War II will begin this year. The investigation is being directed by the Committee on Mortality of the Society of Actuaries, a professional organization of nearly 1500 actuaries in the U. S. and Canada. They will be in consultation with the Mortality Committee of the Association of Life Insurance Medical Directors. Fifty U. S. and Canadian life insurance companies, with some 50,000,000 ordinary life insurance policies in force, have been invited to participate. The investigation will cover the experience under both standard and sub-standard ordinary insurance issued during the years 1935 to 1953 inclusive. It will include only policies issued with a medical examination and only those on persons fifteen to sixty-nine years of age. Evidence is expected to be produced as to the mortality among persons originally classified as overweight who later reduced their weight sufficiently to have their policies put on a standard basis. Individual company assembly of statistics will be completed by the middle of 1956, but tabulation and analysis of the data will probably require an additional year.

Sloan Foundation Makes Grant to Cornell. The Alfred P. Sloan Foundation, Inc., has announced a grant of $750,000 to Cornell University for an Institute of Hospital Administration, the aim of the new unit being to train a select group of students for careers in hospital administration. The course, which will lead to the degree of Master of Public Administration in Hospital Management or to the degree of Master of Business Administration in Hospital Management, will require two years of intensive study on the campus at Ithaca and a year of residency in an appropriate hospital. Twelve students will be admitted annually. The center will give as much attention to research as to its instructional program and will develop also an "in-service" program for existing hospital administrators and hospital personnel.

Nutrition Guide for Public Health Administrators. A new bulletin, *Nutrition Practices: A Guide for Public Health Administrators*, describes the role of nutrition in modern public health practice. It is the result of a two-year study by a subcommittee of the American Public Health Association, of which Dr. Daniel Bergsma, New Jersey State Health Commissioner, was chairman. Members were nutrition researchers, teachers, consultants, and state and local health administrators. A small working committee of nutritionists aiding the larger committee consisted of A.D.A. members Elizabeth Caso, Catherine M. Lemay, Isabel Patterson, and Marguerite

NOW ALL 69 OF THESE QUANTITY-SERVING RECIPES ARE YOURS FOR THE ASKING

MAIN DISH MEDLEY

Oven Fried Chicken
All-Bran Roll-Cakes with Chicken and Mushroom Filling
Oven Pork Chops with Corn Stuffing
Baked Corn and Sausage
Ham and Eggs Supreme
Ham Loaf with Raisin Sauce
Chipped Beef with Macaroni
Oven Chop Suey
Hash Royale
Stuffed Peppers
Featherlight Meat Balls with Noodles
Frosted Meat Squares
Meat 'N Muffin Surprise
Indian Meat Loaf
Crabmeat Cheese Buns
Crunchy Fish Scallop
Fish Roll-Ups With Herb Stuffing
Creamed Eggs and Shrimp

A CARAVAN OF COOKIES

All-Bran Applesauce Cookies
All-Bran Butterscotch Refrigerator Cookies
Blondies • Brown Sugar Pop Tops
Caramel Chews • Cherry Winks
Choco-Chipsies
Chocolate Drop Cookies
Cinnamon Balls
Coconut Crunchies
Corn Flakes Dainties
Corn Flakes Jumbles
Corn Flakes Macaroons
Frosted Gingerbread Bars
Ginger Lassies • Fudgies
Holiday Fruit Drops
Honey Date Bran Bars
Lemon Tea Cookies
Orange All-Bran Fancies
Orange Flakes Drop Cookies
Peanut Butter Crisps
Raisin Spice Cookies
Prune Filled Bran Cookies • Trilbys
Marshmallow Crispy Treats
Rice Krispies Delights
Sugar Frosted Crunchies
Sugar Smacks Chews

DESSERTS THAT ARE DIFFERENT

All-Bran Devil's Food Cake
Chocolate Frosting
Pineapple Upside-Down Cake
Blueberry Upside-Down Cake
Cranberry Upside-Down Cake
Rhubarb Upside-Down Cake
Red Cherry Pudding
Hot Cherry Sauce
Caramel Corn Flakes Ring Sundaes
Frosted Ice Cream Balls
Apple Crunch
Crusted Pears
Spicy Lemon Sauce
Crusted Almond Cream
Peaches and Cream Pudding
Rice Krispies Pineapple Chiffon Pudding
Corn Flakes Crumb Crusts or Pie Shells
Chocolate Chiffon Pudding
Meringue Cream Pudding
Marshmallow Crispy Treats

Compiled in 3 handy recipe booklets available at Convention Booth 204 – or by mail

Here's hoping we get to see you at the convention! We'd like to meet you and give you your complimentary set of three illustrated recipe booklets. But if you can't make it, we still want you to have them. Just send us the coupon and we'll get your booklets in the mail right away. (Sorry, supply limits offer to one set per person).

FLAVOR, THRIFT, AND FOOD VALUE: You will note that a Kellogg cereal is used in each of these quantity-serving recipes—not only to add to the appetite appeal and overall nutrition, but to help you keep your costs down. Of course you know that when you specify Kellogg's cereals for breakfast you are getting *whole grain* nutritive values.

Kellogg's OF BATTLE CREEK

Kay Kellogg
Institutional Division
Kellogg Company, Battle Creek, Michigan

Please send me:

☐ "Main Dish Medley"
☐ "A Caravan of Cookies"
☐ "Desserts That Are Different"
☐ All three recipe booklets

Name_____

Address_____

City_____ Zone_____ State_____

J. Queneau. Some of the questions answered in the *Guide* are:

What are the objectives of public health nutrition services?
What is the role of the public health administrator?
How does he go about utilizing opportunities to carry out his role?
How are these opportunities found?
What is the place of the nutrition program in the entire program of the health department?
How can staff members, apart from nutrition personnel, extend the nutrition program?

Copies of the *Guide* may be obtained from the American Public Health Association, 1790 Broadway, New York 19, New York at $1 per single copy or 75 cents per copy in quantities of 25 or more.

4-H Dairy Conference. Officials of the International Dairy Show announced that the first 4-H Dairy Conference and Tour will be held in conjunction with the International Dairy Show, October 8 to 15. The purpose is to provide 4-H members who excel in dairy projects an opportunity to further their interest in this field. The Conference and Tour will emphasize dairy production, marketing, processing, and the distribution and use of dairy products. Basis for selection of the 100 delegates to the Conference will be: (a) record of accomplishment; (b) boys and girls at least fourteen years old on January 1 of the current year; (c) completion of three years of dairy animal projects; (d) delegates who can make a contribution to the program; and (e) delegates who can pass on to others the inspiration and education they have received.

Food Facilities Engineering Society. The founding of the Food Facilities Engineering Society, for the purpose of promoting research and improving design of public food facilities has been announced. The officers of the Society are: President-Treasurer, Fred Schmid, Los Angeles; Vice-President, John W. Hargrave, Montgomery, Ohio; Secretary, N. Bert Persson, St. Paul. The Executive Board members are: Arthur W. Dana, New York; Ralph J. Mulhauser, Houston; J. Earle Stephens, Detroit; and Sam V. Wells, Chicago. Membership in the Society is open to professional and food facilities consultants who can qualify on the basis of background and experience. The headquarters of the new Society are at 8032 West Third Street, Los Angeles 48.

Interns Graduate. *Ancker Hospital*, St. Paul, Minnesota, announces graduation of the following dietetic interns:

Ruth Okahara, University of Hawaii, Honolulu
Pearl V. Quist, University of Minnesota, St. Paul
Ann M. Ritzinger, Stout Institute, Menomonie, Wisconsin
Joan Stoltzman Weithers, College of St. Teresa, Winona, Minnesota

The *Eastman Kodak Company* recently graduated eight dietetic interns from Kodak's administrative internship program in industrial nutrition. They are:

Jane Bishop, Pennsylvania State University, University Park
Judith Bresler, Ohio University, Athens
Edna Garmene, University of Cincinnati
Barbara Hathaway, University of Connecticut, Storrs
J. Sandra Spahr, Virginia Polytechnic Institute, Blacksburg
Rose Mary Spahr, Indiana University, Bloomington
Barbara Ward, Simmons College, Boston
Phyllis Wauro, Immaculata College, Immaculata, Pennsylvania

Five dietetic interns completed their administrative dietetic internship at *Florida State University*, on August 1. They are:

Judith Ann Burkman, University of Cincinnati
Lourdes Hilario Mendoza, The Philippine Women's University, Manila
Marjorie Lee Plummer, Iowa State College, Ames
Mary Carolyn Rose, Tennessee Polytechnical Institute, Cookville
Sally Ann Rudy, Purdue University, Lafayette, Indiana

On July 2, sixteen dietetic interns completed their year's work at *St. Marys Hospital*, Rochester, Minnesota. They are:

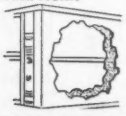
Sister Mary Anthonita, Marywood College, Scranton, Pennsylvania

ONLY BLODGETT OVENS GIVE YOU ALL THESE

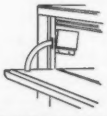
Best Buy Features

BATTLESHIP CONSTRUCTION
Walls and frame in single welded unit for extra durability.

HEAVIER INSULATION
4 INCHES OF FIBER-GLAS saves fuel, keeps kitchen cooler.



COUNTERBALANCED DOORS
Sturdier, yet open with just a flip of the fingers.



AN OVEN BY OVEN SPECIALISTS

When you buy Blodgett, you benefit from the experience, research, engineering and know-how—developed from OVER 100 YEARS OF SPECIALIZATION IN BUILDING OVENS ONLY! For baking, roasting and general oven cookery, Blodgett's built-in features give you MORE for your OVEN DOLLAR! Ask your dealer about Blodgett—your BEST OVEN BUY!

Choose from 24 Models Available in Standard Black, Gleaming Stainless Steel, and Platinum Gray Finishes.

...Blodgett Ovens cook 70% of the menu!

THE G. S. BLODGETT CO. INC.
50 LAKESIDE AVENUE BURLINGTON, VERMONT
IN CANADA, GARLAND-BLODGETT, LTD., 1272 CASTLEFIELD AVE., TORONTO 10, ONTARIO

Cloverlane - *a molded dinnerware made especially for hospitals · restaurants · institutions*

Combining beauty and utility, Cloverlane is really new and different! Different from any other molded dinnerware you've seen, used, or heard about! New mass feeding ideas have been perfected expressly to solve your everyday problems in serving, washing and draining . . . to be easier to handle . . . to take the roughest treatment—and what's more, to fit naturally into the most exclusive restaurants!

Washes cleaner, faster!

You don't baby Cloverlane! It washes cleaner and faster than any molded dinnerware you've ever seen. Cloverlane's convex bottoms and notched bases allow fast, positive drainage . . . constant air circulation . . . no sticking even if dishes are stacked damp . . . provide a firm stacking foundation.

Cloverlane nests neatly—in far less space. And its smooth beaded edges resist chipping and wear. Its light weight means easy handling, both in service room and dining rooms. And Cloverlane cups, with recessed thumb rest give perfect balance.

And nothing matches Cloverlane's economy. In the long run it costs far less than any other type of dinnerware.

All this, and melamine advantages, too!

Quiet, almost silent plate handling! It's a big reason why Cloverlane is so good for hospitals, cafeterias, large-volume restaurants and clubs.

Because of its insulating qualities, foods stay hot on Cloverlane—yet there are no burned hands from preheated plates. This is particularly important in hospitals, or wherever hundreds of diners are served from a central kitchen.

Cloverlane is made by Chicago Molded Products Corp., one of the world's oldest and largest plastics molders . . . designed by Jean O. Reinecke, one of America's top designers. Mail the coupon for full details.

See Cloverlane at the American Dietetic Association Exhibition in St. Louis, Mo., Oct. 18-20. Come to Booth 401.

Dinnerware Division,
Chicago Molded Products Corp.
1014 N. Kolmar Avenue, Chicago 51, Illinois
Send me complete information on new Cloverlane.

Name_____

Address_____

City_____ **Zone**_____ **State**_____

Ann Mary Brungardt, Marymount College, Salina, Kansas
Barbara Barbe Campbell, Our Lady of the Lake, San Antonio
Mary Kathleen Flaherty, College of St. Teresa, Kansas City, Missouri
Joanne Hosford, Stout Institute, Menomonie, Wisconsin
Honore Marie Jones, Clarke College, Dubuque, Iowa
Mary Clare Murray, Marywood College, Scranton, Pennsylvania
Jeanette Oetting, Stout Institute, Menomonie, Wisconsin
Carolyn Joan Ogden, Mount St. Scholastica College, Atchison, Kansas
Nancy Pleune, Michigan State College, East Lansing
Mary Margaret Rigney, Mount Saint Mary College, Hooksett, New Hampshire
Sister Elizabeth Rouble, Mount St. Bernard College, Antigonish, Nova Scotia
Elinor Salcedo, University of the Philippines, Quezon City
Mary Maxine Smith, Kent State University, Kent, Ohio
Phyllis Smith, Marywood College, Scranton, Pennsylvania
Virginia Elaine Wood, Oregon State College, Corvallis

Catholic Hospital Association Film. "The Dedicated," a documentary film on the history and development of the Catholic hospital in ancient and modern times, is a special project of the Catholic Hospital Association in celebrating its fortieth anniversary. The film was produced to assist Catholic hospitals in understanding the over-all function of the modern-day hospital in regard to community, hospital personnel, and mainly, the patient. The film touches briefly on the origin of the hospital and shows the operation of the modern hospital today—from the kitchen to the operating room. The 28-min. film is available to hospitals, religious groups, and other interested organizations and individuals. Inquiries should be addressed to the Catholic Hospital Association, 1438 South Grand Boulevard, St. Louis 4.

Nutrition Workshop. A Nutrition Workshop, sponsored by the Red Cross Food and Nutrition Service, the Rochester and Monroe County Nutrition Committee, the Medical Society of the County of Monroe, and the Rochester Dietetic Association will be held in Rochester, New York, on September 22. The principal address on advances in nutrition will be given by Dr. James M. Hundley, Chief, Laboratory of Biochemistry and Nutrition, National Institutes of Health, Public Health Service, and Consultant on Nutrition, Health and Special Weapons Division, Federal Civil Service Administration.

Another phase of the program will be four discussion groups led by a physician particularly interested in and acquainted with the assigned subject: a dietitian who will discuss any modifications of the required diet; and a public health nurse or nutritionist who will point out the home aspects of the situation. The subjects to be covered are diabetes, arteriosclerosis and aging, heart disease, and obesity.

Public Relations for the Hospital. A successful city-wide Institute on Public Relations was sponsored by the Cincinnati Hospital Council in May with the local dietetic association participating. Using the workshop method, the section on the dietary department selected a panel of individuals who represented each of the six areas in which public relations could be improved: (a) administrators, (b) patients, (c) dietary personnel, (d) medical and nursing staff, (e) salesmen, and (f) maintenance. The panel presented problems, hypothetical or practical, to arouse thinking of the group. This was followed by individual discussion groups in each of the six areas mentioned, where solutions for improving relations were formulated. The resulting summaries were correlated by the leader, Bernard Kasdan of the Adult Education Council. In addition to enumerating the steps to be taken in each of the six areas, the following basic principles of good public relations for dietitians were developed: (a) We should know, understand, and practice the institution's policies and see that our employees do the same. (b) We should be conscious and understanding of the problems and limitations of other departments. To accomplish this, brief meetings of the administrator and the heads of various departments would be in

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1. From dishwasher to storage in one on-the-spot operation.

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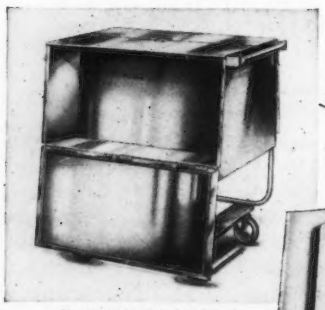
Model 1401-S (with doors) Heavy duty, stainless steel, mounted on two J & J 5" double ball-bearing swivel casters and two 5" rigid casters. Unit above shown without dividers.

Model 1400-S (less doors) Removable dividers simplify orderly dish storage. Distance between dividers must be specified.

Specifications

Overall width	27½"
Overall length	37¾"
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Shelf size (per side)	10½"x32¼"

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order. (c) Our performance in all our duties should exhibit firm kindness, team spirit, shared leadership, open-mindedness, and cooperation. A dietitian concerned with public relations will believe in herself, have something to sell, and do the job right.

Graduate Fortnight. The New York Academy of Medicine will hold its twenty-eighth annual Graduate Fortnight October 10 to 21. The theme of the program is "Problems of Aging." Some of the featured talks will be:

"Psychological Aspects of Aging"—Ross A. McFarland, Harvard University
"Experimental Prolongation of the Life Span"—Clive M. McCay, Cornell University, Ithaca, New York
"Relation of Increased Longevity to Neoplasia"—C. P. Rhoads, Sloan Kettering Institute, New York City
"Some Physiological Aspects of Aging"—N. W. Shock, National Heart Institute, Bethesda, Maryland
"Nutritional Problems of Advancing Age"—Fredrick J. Stare, Harvard School of Public Health, Boston
"Gastrointestinal Hemorrhage in Elderly Patients"—Thomas P. Almy, Medical College, Cornell University

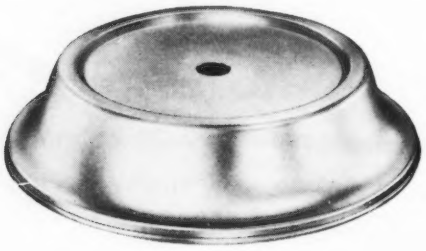
The complete program includes twenty-one major talks and ten panel discussions by outstanding leaders in the medical and scientific fields. Non-medical, but interested persons concerned with the problems of aging will be welcome as participants in the Graduate Fortnight. Inquiries relative to the program should be addressed to the Executive Secretary, Committee on Medical Education, The New York Academy of Medicine, 2 East 102 Street, New York 29.

American Public Health Association Meeting. The eighty-third annual meeting of the American Public Health Association will be held in Kansas City, Missouri, at the Municipal Auditorium, November 14 to 18. More than 5000 public health workers from all parts of the free world are expected to attend. The theme of the meeting will be "Where are we going in public health?" This assembly will deal with the changing factors such as population redistribution, increased mobility of people, and increase in the aged population. At the close, representatives of the Association's thirteen specialized sections will summarize the week's discussions in an effort to evaluate present public health activities and to draw implications as to future program patterns.

American Heart Association. The first meeting of the Council on Community Service and Education of the American Heart Association will be held this year, as part of the annual meeting of the Association in New Orleans in October. The program on nutrition will deal with body weight and heart disease. A.D.A. has been asked to participate in the discussion of public and patient education in a weight control program.

Tomato Powder. High-quality tomato powder can be produced by a continuous process in commercial vacuum-drying equipment. The powder, which reconstitutes into delicious tomato juice when mixed with water, requires no refrigeration, and since it lacks the water that makes up so large a part of fresh tomatoes and ordinary tomato products, it is very light in weight. Developed first in batch-type vacuum drying equipment by the U.S.D.A.'s Western Utilization Research Branch at Albany, California, the powder can be used for making tomato paste, soups, and other foods, as well as tomato juice. More work is needed on preparing the raw materials, on retaining quality during storage, and on marketability.

New Fruit Powder. Lemonade powder, rich in natural flavor, is the latest of several easy-to-use fruit powders to be produced by the U.S. Department of Agriculture. One of these powders—from orange juice—is already in commercial production, but it is being packaged only for institutions, food manufacturers, and other large-scale users. Food processors are also interested in the laboratory's tomato juice powder. Neither the tomato juice nor the lemonade powder are being manufactured yet. Like the other powders, the lemonade powder is easy to ship and store, and requires no refrigeration. It dissolves instantly in cold water to make a beverage equal in flavor and nutritive value to lemonade prepared from freshly squeezed juice. Essentially, the powder components are the same as those present



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in fresh lemonade—only the water is missing. An in-package desiccant is used to reduce the moisture content of the powder to 1 per cent or less, thus helping to preserve its quality in extended storage.

New Strawberry Jam. A new strawberry jam made from fresh berries without cooking or even heating has been developed by the U.S. Department of Agriculture. The jam has a delicious fresh-fruit flavor, bright natural red color, and a texture jellied just enough to hold its shape and spread well. To make it, pectin is stirred into raw crushed sweetened berries, and then the mixture is put into jelly glasses. It is stored in the refrigerator and holds its freshness several months. The recipe has also been tried in home kitchens, and the results were favorable.

Facts about Meat. The National Pork Promotion Conference held in Chicago July 19 by the U. S. Department of Agriculture brought out many facts concerning meat consumption in the U.S. Since 1952 there has been a decrease in the amount of pork consumed per person and a slight increase in the amount of both beef and poultry.

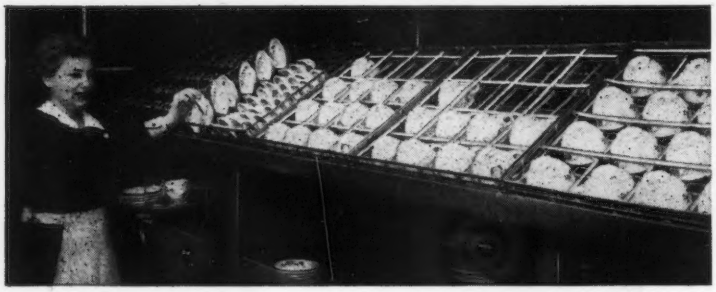
Chicken consumption per person has increased from a 1937–41 average of 14 lb. to over 23 lb. Turkey consumption is up from 2.5 lb. in 1937–41 to nearly 5 lb. per person per year. The decrease in pork consumption and the percentage of income spent on pork is due in part to the availability of beef. There have been some shifts of population out of pork-eating areas, and fat cuts of pork have become less popular, a fact leading to the trend toward a meat-type hog.

New Uses for Pastry Flour. Experiments at Cornell University have shown that pastry flour gives excellent results in baking quick breads. With pastry flour, even if the dough is given extra handling, the product will be tender. This is attributed to the pliability of the gluten in the pastry flour. In using pastry flour, two extra tablespoons are needed for each cup of flour called for. This flour has been used successfully at Cornell in muffins, biscuits, cornbread, fruit breads, popovers, pancakes, and waffles.

Bulletin on Potatoes. The U. S. Department of Agriculture has published a new report, *Cooking Quality and Composition of Potatoes of Different Varieties from Several Commercial Locations*, Technical Bulletin No. 1106. More than thirty new varieties of potatoes have been introduced for improved yield and resistance to disease and insects during the last twenty years. Six varieties represent slightly over 40 per cent of the certified seeds produced. The study was made to show the relationship between cooking quality and composition of Chippewa, Green Mountain, Irish Cobbler, Katahdin, Russet Burbank, and Triumph potatoes. Copies of the bulletin are available from the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. for 35 cents a copy.

Restaurant Personnel Relations. "Who's Telling Who?" is a booklet for restaurant owners and managers which tells how to put your ideas across to restaurant workers. Published by the National Restaurant Association, the booklet is a fictional story about J. Hamilton Bigger, Owner, Chez Big, in Boomville. The story deals with employee communications and tells how good employee relationships will help bring in profits to the restaurant owner. Suggestions are given for dealing with employees.

List of Published and Processed Reports. The Office of Experiment Stations of the U. S. Department of Agriculture has prepared *A List of Published and Processed Reports of Research in Foods, Human Nutrition, and Home Economics at the Land-Grant Institutions*, October 1952–October 1953 and October 1953–October 1954. The material has been classified by states and further organized into the following classifications: Family and Food Economics; Family Life and Child Development; Family Relationships; Food Composition and Nutritive Value; Food Preparation and Utilization; Food Processing and Technology; Food Quality and Standards; Home and Institutional Management; Home Economics Education; Miscellaneous; Household Equipment; Housing; Nutrition and Diet; Reports; and Textiles and Clothing.



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*Union Scale Chicago, Ill., Apr. 1, 1955.

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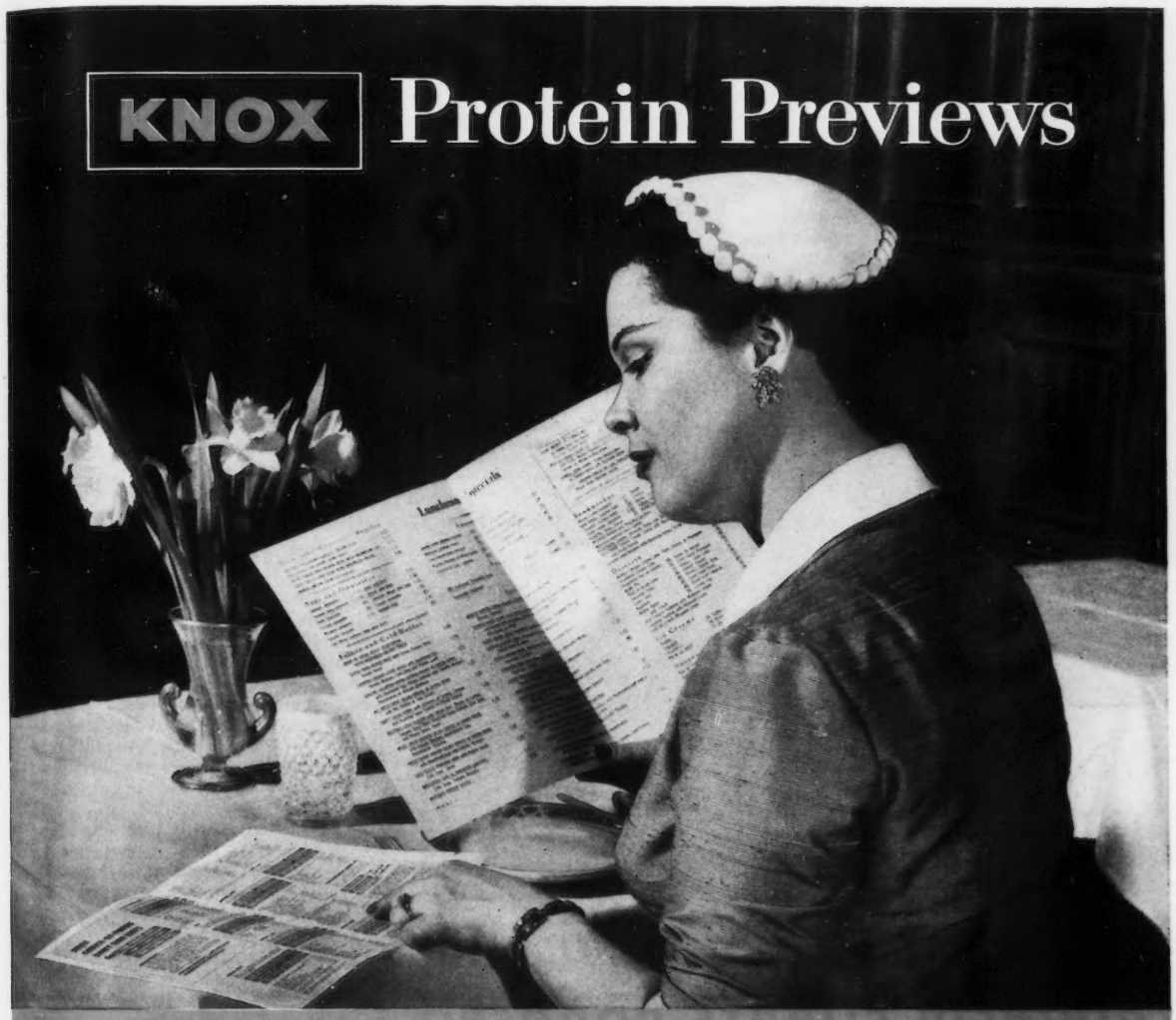
KNOX Protein Previews



New Knox Food Exchange Chart
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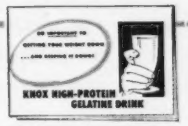
To help your obese patients reduce and stay reduced, Knox introduced this year a new dieting plan based on the use of nutritionally tested Food Exchanges.[1] The very heart of this new dietary is a "choice-of-foods diet list" chart which presents diets of 1200, 1600 and 1800 calories.

Each of these diets may be easily modified to meet special needs. However, the important points for your patients are that the use of this chart eliminates calorie counting, permits the patient a wide range of food choices and dispels that old empty feeling by allowing between-meal snacks.

These advantages should make your management of difficult and average cases easier. If you would like a supply of the new Knox charts for your practice, just fill in the coupon below.

1. Developed by the U. S. Public Health Service assisted by committees of The American Diabetes Association, Inc. and The American Dietetic Association.



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News of State Associations

Iowa Dietetic Association. On April 22, the Iowa Dietetic Association met at Friley Hughes Hall in Ames. Outstanding events of the session included a summary by Dr. Ercel Eppright of the Weight Control Colloquium held in January at Iowa State College, and a talk on A.D.A. affairs by Fern Gleiser. The afternoon session began with a talk by Dr. Lee Forest Hill of Des Moines on "Trends in Infant Nutrition." John M. Welch of the DuBois Company, Inc., then spoke on "A Practical Discussion of the Dishwashing Problem."

The Seventh Annual Health Education Workshop was held at the Center for Continuation Study, the State University of Iowa, Iowa City, June 7 to 9. The Iowa Dietetic Association was one of the sponsors and was represented at the planning session in April by Mary Lou Schuttler, Therapeutic Dietitian, Iowa Methodist Hospital, Des Moines.

Maryland Dietetic Association. Two new officers have been elected by the Maryland Dietetic Association for 1955-56: President-Elect, Celia Whitney, Baltimore; and Treasurer, Elizabeth J. Hines, Union Memorial Hospital, Baltimore.

The Food Administration Section of the Maryland Dietetic Association and the Maryland State Department of Health held a meeting at Deer's Head State Hospital, Salisbury, on Friday, April 15. The topic of the day was, "The Relationship of the Dietary Department to Total Patient Care." The panel members each gave their interpretation of the subject. Participants were:

The Physician—Dr. Florence Mahoney, Director of Physical Medicine and Rehabilitation of Chronic Disease Hospitals.

The Nurse—Katherine Childs, Director of Nursing, The Memorial Hospital, Easton.

The Dietitian—Janette Carlsen, Dietitian in Charge, The Johns Hopkins Hospital, Baltimore.

The Administrator—Dr. Linus A. Zink, Assistant Chief, Medical Director for Operations, VA Hospital, Washington, D. C.

The moderator for the panel was Alicia Smith, Chief, Dietetic Service, VA Hospital, Baltimore.

New York State Dietetic Association. A project to have a one-page picture spread of the professional activities of its members in the Ithaca *Journal* was accomplished this year by the *Cayuga Dietetic Association*.

As a result of much hard work on the part of many of its members, the *Greater New York Dietetic Association* was successful in keeping the standards of A.D.A. as qualifications for dietitians' civil service jobs in New York City.

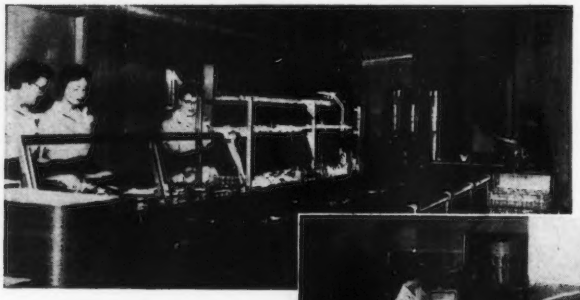
A light-weight exhibit, "Children Learn Healthful Eating through Happy Experiences" has been prepared by the *Hudson Valley Dietetic Association*. It was used as the state exhibit at the New York Annual Health Conference in June.

As part of their vocational guidance program, the members of the *Rochester Dietetic Association* worked with the Future Nurses Clubs, since these girls are interested in other hospital careers besides nursing.

In April, the *Long Island Dietetic Association* held a joint meeting with the State Education Food Service Training Group at the Great Neck Junior High School, Great Neck, Long Island. A display of posters and food service training material on sanitation was prepared for the group to review. The main speaker on the program was Dr. Jackson I. Tartakaro, epidemiologist of the Nassau County Health Department, whose topic was "Food Infection and Food Poisoning —Related to Food Preparation and Handling."

Oklahoma Dietetic Association. Elected in March, the new officers of the Oklahoma Dietetic Association are: President, Betty A. Darcey, Head Dietitian, VA Hospital, Oklahoma City; President-Elect, Kathleen Atha, Therapeutic Dietitian, St. John's Hospital, Tulsa; and Treasurer, Sister M. Laetitia Szalewicz, Okarche Memorial Hospital, Okarche.

The Scholarship Committee of the Oklahoma Dietetic Association presented an award of $100 to a graduating senior of Oklahoma University, Lucille Enix. Alternate winner and recipient of



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INSIDE SCIENCE

The Vital Story of VITAMIN C

by Science Writer

What does vitamin C do for human beings?

Medical research shows that it is essential in maintaining healthy bony tissue and for the formation of collagen which is the main supportive protein of skin, tendon, bone, cartilage and connective tissue. It is needed for vascular function and tissue respiration and in promoting the healing of wounds. In lactating women it has great importance in providing the infant with a sufficient amount of ascorbic acid to prevent scurvy, a disease to which very young babies are susceptible.

Much evidence is available in medical reports to show that a lack of this vital nutritive element can result in impaired health. And in those cases of frank scurvy which still occur, ascorbic acid is the specific medication.

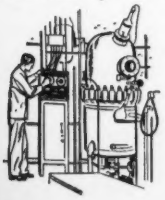
History. The history of vitamin C is fascinating. Scurvy, known for centuries, was once the most prevalent disease in Europe. It afflicted the Crusaders, decimated the crews of voyagers and armies, and plagued the colonists of the New World. In the 18th Century the antiscorbutic value of fresh vegetables and citrus fruits was recognized.

Isolation. It was not until 1918-25 that almost pure ascorbic acid was concentrated from the lemon by Zilva and its important properties and molecular composition established. In 1927 he concluded that this so-called "reducing factor" and the antiscorbutic principle were closely related. In 1928, Szent-Györgyi, who started investigations in 1921, isolated a strong reducing compound from adrenal glands, oranges, and cabbage and termed it "hexuronic acid."

Chemistry. The "reducing factor," "hexuronic acid," and vitamin C were all identified as the same in 1932 by various groups of workers. This was one year after C. G. King, by methods of organic chemistry and experimental physiology, established the chemical identification of vitamin C, thus fulfilling Budd's prediction of 90 years earlier that the antiscorbutic property of certain foods would ultimately be discovered to be a definite substance.

Synthesis. In 1933 Reichstein and his colleagues in Switzerland successfully synthesized ascorbic acid. Almost simultaneously in England Haworth and associates accomplished the same. The Reichstein synthesis formed the basis for large scale commercial production by the world-famous firm of Hoffmann-La Roche.

Production. Following these discoveries came the establishment of manufacturing operations so that today daily production by the tons is the rule. The figures are really staggering. The amount produced weekly in the U. S. A. averages over 15 tons, equivalent to that contained in over 200 million oranges. It is remarkable that ascorbic acid can be produced synthetically and sold for only about $16. per kilogram. One kilo is sufficient to supply 92 people for one year with the minimum daily requirements set by the U. S. Food and Drug Administration.



Vitamin C made by the Roche process is identical chemically and in biological activity with Nature's own product. Because vitamins can be manufactured at a much lower cost than if they were extracted from natural sources they are widely used in dietary supplements and pharmaceuticals. In fact, "New and Non-official Remedies," a publication of the American Medical Association for use by physicians states: "All pure ascorbic acid used in pharmaceutical products is prepared synthetically."

Ascorbic acid is present in many foods. Nature supplies some with lavish amounts and stints on others. In fact, wide variations* have been found in the vitamin C content in varieties of the same fruit.

Deficiencies. Many surveys have shown widespread vitamin C deficiencies in the population. Physicians may call these subclinical, but they are deficiencies nevertheless.

Because of these situations—natural variation and widespread deficiencies—diet experts believe that it is desirable and in the public interest to standardize the vitamin C content of processed fruit and vegetable juices by the addition of enough pure crystalline ascorbic acid to make them consistently dependable sources of this necessary food element. Some of these juices are: tomato, grape, orange, grapefruit, pineapple and apple.

Requirements. The U. S. Food & Drug Administration has set 30 milligrams as the adult minimum daily requirement of ascorbic acid. This daily intake is just about sufficient to prevent recognizable signs of vitamin C deficiencies although a subclinical or an unrecognized deficiency may exist. In view of this, the National Research Council has established 75 milligrams as the recommended daily male adult allowance and 70 mg. daily for female adults, which levels are supported by many controlled nutrition studies. However, the N. R. C. recommends 90 mg. daily for boys between 13 and 15, 100 mg. daily for boys between 16 and 20, and 150 mg. daily for lactating women.

This article is published in the interests of pharmaceutical manufacturers and food processors who make their good products better with essential, health-giving vitamin C. Reprints are freely available. Vitamin Division, Hoffmann-La Roche Inc., Nutley 10, New Jersey. In Canada: Hoffmann-La Roche Ltd., 286 St. Paul Street, West; Montreal, Quebec.

*The table shows minimum and maximum levels of ascorbic acid in commercially canned juices. All figures are in milligrams per 100 grams of juice. Data from U. S. Department of Agriculture.

	Min.	*Max*
Apple juice	0.2	3.6
Grape juice	0.0	4.7
Grapefruit juice	10.0	49.0
Orange juice	9.7	70.0
Pineapple juice	5.4	18.0
Tomato Juice	2.5	32.0

Advertisement

the Davis Grocery Award was Joann Reherman. Both girls will take their dietetic internship at the VA Center in Los Angeles.

Oregon Dietetic Association. Ruth V. Bowen, Dietitian, Good Samaritan Hospital, Portland, is working with the Oregon Heart Association conducting classes for their weight reduction program. A report of the program will be made at the fall meeting of the Oregon Dietetic Association.

Pennsylvania Dietetic Association. A highlight of the twenty-second annual meeting of the Pennsylvania Association in April was the awarding of scholarships to prospective dietetic interns. Five such scholarships were given—the T. V. Du Bois Foundation Scholarship of $200 and four Frances L. Swenson Scholarships of $100 each. The Du Bois Scholarship went to Audrey Mick, a graduate of Juniata College, Huntington, Pennsylvania, who is now interning at the University of California, Berkeley.

Recipients of the Frances L. Swenson Scholarships were: Barbara S. Glick, Drexel Institute of Technology, interning at The Jewish Hospital, Brooklyn; Mary Elenora Monroe, The Pennsylvania State University, interning at Shadyside Hospital, Pittsburgh; Alice J. Boorman, The Pennsylvania State University, interning at The Ohio State University Hospital, Columbus; and Marian Erdman, The Pennsylvania State University, interning at The New York Hospital, New York City.

New officers of the Pennsylvania Dietetic Association for 1955–56 are: President-Elect, Audrey M. Paterson, Nesbitt Memorial Hospital, Kingston; and Secretary, Katherine E. Louser, Norristown State Hospital, Norristown.

Rhode Island Dietetic Association. The annual dinner meeting of the Rhode Island Dietetic Association was held on May 16 with Doris Johnson, Director of Dietetics, Grace-New Haven Community Hospital, as speaker. Dr. Johnson talked about the Association and the work of the Diet Therapy Section, of which she is chairman.

The final meeting of the season was held on June 6 at Memorial Hospital, Pawtucket. At this time two new officers were elected: President-Elect, Lois Yohe, Chief Dietitian, Memorial Hospital, Pawtucket; and Secretary, Dorothy Bailey, Supervisory Dietitian, State Hospital, Howard.

South Carolina Dietetic Association. New officers of the *Columbia Dietetic Association* were elected at a meeting April 26. They are: President, Priscilla Reynolds, VA Hospital; Secretary, Katherine C. Vaughan; and Treasurer, Julia P. Brunson, VA Regional Office.

Tennessee Dietetic Association. Chattanooga was the host city for the first annual spring meeting of the Tennessee Dietetic Association, held May 20, at the Hotel Patton. Featured speakers and their subjects were:

"The Dietitian's Role in Civil Defense"—Mary T. Peacock, Director of Health Education, Chattanooga - Hamilton County Health Department

"What I Expect of My Dietitians"—Harold L. Peterson, Administrator, Baroness Erlanger Hospital, Chattanooga

"Personality"—Ernest A. Clebenger, Vice President and Sales Manager, Corley Manufacturing Company, Chattanooga

"The Doctor-Therapeutic Dietitian Team"—Dr. F. Tremaine Billings, Associate Professor of Medicine, Vanderbilt University School of Medicine, Nashville

"Food Service Controls Mean Dividends"—Mildred Johnson, Manager, Sherries Restaurant, Nashville

A panel was also presented on the merits of a male food service manager vs. a dietitian. Moderated by Betty Cotter, Executive Dietitian of Erlanger Hospital, the panel consisted of her administrator, Harold L. Peterson, and Ernest L. Bliss, Administrator, Jackson-Madison County General Hospital, Jackson.

Leva Osbirn was chosen "Dietitian of the Year" for 1954–55 for the state of Tennessee. She received an A.D.A. plaque in recognition of this honor and publicity in the local papers. Mrs. Osbirn has been president of the *Memphis Dietetic Association* for the past year and is dietary consultant for the Collins Chapel

Appetites Need Tempting?
Budgets Need Cutting?

LET MAGGI DO IT!

The meal-planner's best friend! . . . Anywhere meal-planning is a problem, Maggi's Granulated Bouillon and Maggi's Seasoning can be a big, BIG help.

Coaxes out hidden flavor! . . . Maggi's Seasoning is a highly concentrated cooking aid that multiplies and emphasizes the natural taste of food. Makes meats, casseroles, gravies, stews taste marvelous! Maggi's Granulated Bouillon Cubes dissolve instantly, add appetizing, meaty flavor.

Economical, easy to use! . . . Naturally, Maggi's cooking aids make low cost dishes taste better . . . transform leftovers into treats, all in a few seconds time! So keep these world-famous products—Maggi's Seasoning and Maggi's Granulated Bouillon Cubes—always on hand!

Let MAGGI aid in special diets, too!

Maggi's Seasoning and Maggi's Granulated Bouillon Cubes are high in protein, low in calories. Extremely easy to digest . . . even more digestible than simple foods such as toast. (Not recommended for salt-free diets.)

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VALUABLE FOOD PLANNING TIPS! Quantity recipes for delicious soups, stews, meat dishes!

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MAGGI'S® SEASONING — GRANULATED BOUILLON CUBES

Meat...

and America's Freedom from Protein Malnutrition

America is relatively free from extreme forms of protein malnutrition, since meat and other sources of protein make up a substantial portion of the national dietary. On the other hand, peoples of tropical lands, whose dietary provides little meat or other high quality protein, suffer widespread protein deficiency.[1]

In its severe form, protein malnutrition is "characterized by generalized edema, chronic bulky diarrhea with remnants of undigested food in the feces, hypoproteinemia, and atrophy of small intestinal mucosa and of the pancreatic acini, as well as by fatty infiltration of the enlarged liver."[1] Other characteristics are changes in pigmentation and ulceration of the skin, and depigmentation of the hair. "Mental apathy and often peevishness are outstanding psychological attributes of children with severe protein malnutrition."[1]

Clinical sequelae of protein malnutrition include kwashiorkor and liver disease.[1] In kwashiorkor the caloric intake may approximate normal, but the dietary protein is less than the necessary minimum in quality and quantity. Many tropical diets supply 10 to 15 per cent of the calories in the form of vegetable protein. Kwashiorkor may follow infections, especially of the gastrointestinal tract. Diets below 10 per cent in protein calories lead to frank protein malnutrition, including signs and symptoms of kwashiorkor.

In 5,000 autopsies on African natives no normal liver was found.[2] Infantile cirrhosis with ascites, prevalent in Jamaica, is believed to result from protein deficiency. Toxic, postnecrotic cirrhosis in children in India occurs concomitantly with low intake of protein, especially animal protein.

Government estimations indicate that 156 pounds of meat (carcass weight: beef, veal, lamb, and pork) were consumed per capita in the United States in 1954.[3] Providing large amounts of protein, vitamin B complex, and essential minerals, meat contributes valuably to the good nutrition of the American people. Meat is outstanding both in the amount and in the biologic quality of its protein.

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1. Gyorgy, P.: On Some Aspects of Protein Nutrition, Am. J. Clin. Nutrition 2:231 (July-Aug.) 1954.
2. Davies, J.N.P.: Kwashiorkor, Trans. Ninth Conf. on Liver Injury, Josiah Macy, Jr. Foundation, 1950, p. 109.
3. The National Food Situation, Washington, D. C., Agricultural Marketing Service, United States Department of Agriculture, Oct. 29, 1954, p. 4.

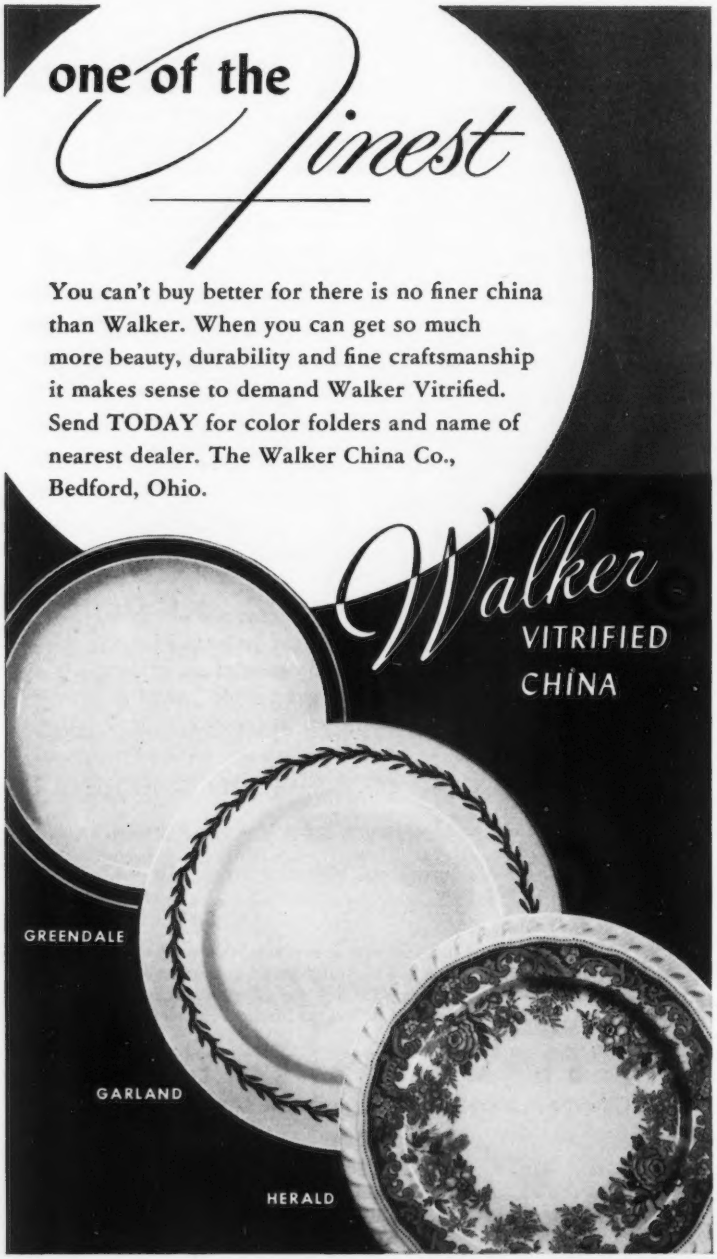
The nutritional statements made in this advertisement have been reviewed and found consistent with current medical opinion by the Council on Foods and Nutrition of the American Medical Association.

American Meat Institute
Main Office, Chicago... Members Throughout the United States

Hospital. Her selection was based on contributions to the dietetic profession and service to the community.

The newly elected officers of the *Nashville Dietetic Association* for 1955–56 are: President, Dr. L. Margaret Johnson, George Peabody College; President-Elect, Aletta Gehres, Vanderbilt University Hospital; and Secretary-Treasurer, Aileen Still, Vanderbilt University Hospital.

Wisconsin Dietetic Association. The Wisconsin and *Milwaukee* Dietetic Associations were among the cooperating agencies sponsoring the second workshop on Teaching Nutrition and Dietary Practice to Student Nurses. The workshop was held June 2 at Milwaukee-Downer College in Milwaukee. One hundred and thirty people from all over the state attended. Exactly half of the group were dietitians or representatives of home economics. The other half were nurses, mostly heads of nursing schools or nursing school educators. The program was planned to carry out the suggestions of those who attended last year's workshop and who sent in answers to a post-workshop questionnaire. A similar questionnaire is being sent out this year. Other cooperating agencies were the Wisconsin Hospital Association, the State Board of Health, the State Department of Nursing, the State League of Nursing, the Hospital Council of Milwaukee, the Milwaukee District League of Nursing, and the Dairy Council of Milwaukee.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Obituaries

Frances Hanold. Word has been received in the Association office of the death, April 16, of Frances Hanold, who for the past four years has been staff dietitian at the E. I. duPont de Nemours plant in Deepwater, New Jersey. Previous to World War II, Miss Hanold was in charge of food service in the dormitories at Drexel Institute, Philadelphia. During World War II, she served with the Army in Burma and India.

Sarah Elizabeth Murphy. The A.D.A. office has been notified of the death of Sarah Elizabeth Murphy on June 6. For the past five years Miss Murphy was staff dietitian at the VA Hospital, Lyons, New Jersey.

News of Products and Services

Institutions Magazine is sponsoring its second "Visit Your Dealer Week" September 19 to 23. Promotion kits are being prepared for the dealer participants. Each kit includes a procedure manual, posters, advertisements for both sectional and local use, invitations, pennants, store trim, and other material. Visit Your Dealer Week was inaugurated last year to bring more customers into the showrooms of dealers to the institutional market. The two hundred dealers who participated last year were enthusiastic in their accounts of new business which developed as a result of the promotion. Even greater success is predicted for this year.

"Harvest Festival" is the title of the combined industry promotion of the *United Fresh Fruit and Vegetable Association* and the *American Meat Institute*. The program, aimed at those who guide the consumer in the purchase of beef and vegetables, is being launched at a press meeting on September 8. Members of the press and program directors of radio and television networks have received special kits of recipe materials featuring beef and vegetables and articles on both industries. This year's campaign will not only combine the forces of the two industries, but also the promotional and merchandising power of allied industries in both fields.

The Inland Manufacturing Co. has introduced the "Magic Touch" ice tray. Thirty-eight ice slices can now be frozen in the same area as fourteen ice cubes of the conventional shape. These long, thin segments of ice are designed for greater convenience. Each ice slice has approximately the same cooling surface as present ice cubes, allowing more than two and a half times as many ice segments to cool drinks. The slices can be frozen in less than half the time of the conventional cube shape and are easier to use in making cracked ice. The "Magic Touch" lever on the tray allows for removal of as many slices as desired, without disturbing the others. The trays are aluminum, for quickest freezing re-

Ruud-Monel and Crane-Monel two-temp Sanimaster 80-80. Requires less than 1 sq. yd. One man installation. Meets your code requirements. 180° sanitizing rinse air-dries dishes. Eliminates costly hand toweling.

You can be sure of sparkling, air-dried dishes and cutlery when a Monel Sanimaster supplies your dish washer. The Sanimaster provides two temperatures of water from the same Monel tank at the same time! 180° for the sanitizing rinse and 140° for general purpose use.

Sanitize and air-dry your dishes with a constant supply of 180° rust-free water ...from this MONEL tank

Your dishwashing troubles are over...

Once you've installed a Ruud-Monel or Crane-Monel *two-temp* Sanimaster gas water heater.

For now you have a long-life hot water tank made of strong, wear-resistant MONEL®... the solid, high-nickel alloy that is highly corrosion resistant and rust-proof at *all* temperatures.

Now you get a constant supply of the two kinds of hot water you need... at the same time: 180° *sanitizing* hot water for dishwashing machines; 140° *regular* hot water for pot sinks, faucets and lavatories.

Now you need no external or auxiliary units ...for Sanimaster is a compact, self-contained unit, *without* coils. Meets all temperature and flow-rate requirements of the National Sanitation Foundation.

Get perfect dishwashing results... with this two-temperature water heater. Insist on either the Ruud-Monel or Crane-Monel Sanimaster. Mail coupon for details.

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Monel two-temp *Sanimaster gas water heaters are sold only by Ruud Manufacturing Company and Crane Co.*

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Dept. JADA 9-55
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sults and are specially designed for stacking.

Procter and Gamble is market testing a new liquid shortening, "Whirl," in Cincinnati, Dayton, and Columbus, Ohio, in *American Can Company's* specially developed non-drip "metal bottle." It is the packaging industry's first use of this type of can for a liquid food product. The can, which comes in pint and quart sizes, carries a colorful red and blue, spot resistant foil label that provides full surface display. Another advantage of this type of container for mass-volume items is that the cans can be produced economically on high-speed automatic equipment.

Meterflo Dispensers has introduced a new line of bulk milk dispensers which offer serving convenience and product cost control. Simply by pressing a button or dropping a coin, the dispensers deliver a pre-set controlled portion (1 to 24 oz.) of refrigerated milk. Delivery rate can be metered up to 4 oz. per second. Serving temperature is maintained at about 40°F. These dispensers are adaptable to all types of food service installations in schools, hospitals, cafeterias, and industrial plants. With a coin box, the units can be used in such places as school dormitories, industrial plants, offices, and recreation rooms. The dispensers use standard 5 and 10 gal. dairy cans and are available also for other dispensing operations, such as sirup flavorings, milk shakes, and refrigerated juices.

NOW! This New Gleaming, Attractive VOLLRATH stainless steel Bedside Set

3-pc. Bedside Set includes:
No. 6841 — Water Bottle, 1 qt. cap.
No. 6847 — Tumbler, 7 oz. cap.
No. 8110 — Tray, 10¼ x 6¾ x ½ in.

Water bottle unbreakable . . . will not impart any "foreign" taste

Good looks and good service go hand in hand with this wonderful Vollrath stainless steel Bedside Set. Its gleaming finish lasts through the years . . . the sturdy steel takes the bumps in stride. And nothing is easier to keep sterile than stainless steel! Write us for complete information today.

First in STEEL Utensils
Stainless Steel and
Porcelain Enameled Steel

SINCE 1874
The Vollrath Co.
SHEBOYGAN, WISCONSIN

Published by *Klenzade*, "Modern Sanitation Practices" is a booklet which is concerned mainly with dishwashing. The booklet gives advice on modern sanitation and illustrates the rules of machine dishwashing, glass washing, pot and pan washing, cleaning deep-fat fryers, hand dish washing, cleaning coffee brewing equipment, and a page on common detergent functions. Three charts show: bacteria control, food storage temperatures, and temperature and chemical activity. There have been great strides in today's sanitation procedures as a result of technologic advances in science, but the actual procedures of cleaning and sanitizing are simplified by the application of detergents and bactericides. For that reason, the sanitation problem resolves itself into: (a) selecting quality materials designed for specific cleaning and sanitizing tasks; (b) designing a cleaning program which utilizes these products most effectively and economically; and (c) carrying out such a program properly.

Metropolitan Wire Goods Corporation has a new sterilizing basket on the market which can be used not only for washing glassware, but chinaware as well. The basket has a plastisol-coated insert surrounded by a protective wire frame. The insert protects the china against contact with metal, also reducing noise and shock. The outer shell has two heavy reinforcing rods on the two sides where most of the wear occurs. This reinforcement keeps the mesh insert from becoming knocked out of shape.

The merger of The Moran Company, Dallas, with *Economics Laboratory of Texas, Inc.*, has been announced. The Moran Company manufactures liquid and powder soaps for commercial use.

Southern Equipment Company has selected eight installations of its products for presentation in a thirty-two-page brochure for those who are planning food preparation and serving layouts. Photographs and floor plans illustrate how typical problems were solved.

Griswold Manufacturing Company is manufacturing a new 30-in. griddle that will cook up to 320 hamburgers an hour. Made of cast iron, the griddle plate is mounted flush with the top surface of the frame and is sealed to prevent grease or spillage from leaking to the inside of the appliance. The unit has enclosed tubular heating elements which are arranged to provide even heat over the entire grid area. A grease drawer holds over a gallon of grease and scrapings and can be easily removed from the front of the unit. The same features are also available in an 18-in. griddle.

New changes in its Model B units have been announced by the *Universal Dishwashing Machinery Company*. These are compact, space-saving units designed for soda fountain, small restaurant, and diet kitchen installation. The changes include addition of stainless steel strainer pans, tracks, wash arms, and other fittings to provide a quality of material that will be more suitable to withstand strong detergents. Another improvement is a newly developed revolving wash and a new light-weight balanced rinse line.